

COMMISSION OF THE EUROPEAN COMMUNITIES

**A STUDY OF THE EVOLUTION
OF CONCENTRATION
IN THE PHARMACEUTICAL INDUSTRY
FOR THE UNITED KINGDOM**

October 1975

The Commission felt that the pharmaceutical industry in the Member States was one of the industries that should be studied in order to provide the Commission with the information it needs to implement competition policy under the EEC Treaty.

The industry in each of the original Member States has already been examined. Further studies have also been carried out in France, Italy, the Netherlands and Belgium to update the information initially obtained.

The first study of this kind to be carried out in the new Member States was in Denmark. The following report gives the results of the study made in the United Kingdom.

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**A STUDY OF THE EVOLUTION
OF CONCENTRATION
IN THE PHARMACEUTICAL INDUSTRY
FOR THE UNITED KINGDOM**

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October 1975

P R E F A C E

The present volume is part of a series of sectoral studies on the evolution of concentration in the member states of the European Community.

These reports were compiled by the different national Institutes and experts, engaged by the Commission to effect the study programme in question.

Regarding the specific and general interest of these reports and the responsibility taken by the Commission with regard to the European Parliament, they are published wholly in the original version.

The Commission refrains from commenting, only stating that the responsibility for the data and opinions appearing in the reports, rests solely with the Institute or the expert who is the author.

Other reports on the sectoral programme will be published by the Commission as soon as they are received.

The Commission will also publish a series of documents and tables of syntheses, allowing for international comparisons on the evolution of concentration in the different member states of the Community.

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SUMMARY AND CONCLUSIONS

Part I of this study (Chapters 1 and 2) provides a variety of statistical measures of concentration, based upon individual company data obtained largely from their Annual Reports. It concludes that turnover and employment concentration measures are likely to be the most meaningful, and that during the period 1968-72 concentration ratios of turnover have been broadly stable (whether measured on an 'enterprise' or a 'units of economic account' basis), while the concentration ratios of employment have been declining slowly.

Concentration levels based on 'units of economic activity' do not appear to have been very high (the four-firm concentration ratio of turnover - the simplest and most meaningful figure - was in the region of 40%), but those based on 'enterprise' data were much higher.

Part II of the study is on an entirely different basis. It examines the overall competitiveness of the U.K. pharmaceutical industry from a retail marketing point of view (excluding the hospital market), and over a longer period than in Part I - generally covering 1964, 1968 and 1973. This longer time perspective shows some different trends in 1964-68 than from 1968 onwards. The focus is on retail products, grouped initially into 14 principal therapeutic classes or categories (all being products that have to be prescribed by a qualified medical doctor). This part of the study covers Chapters 3, 4 and 5.

No small group of manufacturers or of products dominates over this entire market, but within each of the industry's major market segments (therapeutic categories) a few firms do occupy large shares of the market, and their share increased over the period 1964-73. Moreover, the largest companies all hold strong market positions in one or more of the 14 largest categories.

However, within each market segment the leading brands and companies changed significantly between 1964 and 1973. Thus, while the overall concentration ratios shown in Part I exhibited some stability or even

occupy the same positions over the whole period. During those years over 400 completely new products were introduced; and this largely accounted for the rise or fall of particular companies.

Thus a complex pattern of cause and effect relationships appears to exist between concentration and various elements in the marketing mix, and unique product characteristics - as well as a variety of largely unexpected factors - appear to influence market shares.

The development of replacement products within therapeutic categories has been successfully used by some companies to protect high market share positions; on the other hand, price reduction strategies appear to have been generally ineffective in achieving market dominance. But dominance, once having been achieved through product success, provides the cash flow to attempt to sustain that position. This is not, however, always successful.

A separate study (Chapter 6) was carried out of 'over-the-counter' (OTC) sales through retailers (products for the treatment of common ailments that do not require a doctor's prescription). Ten large companies control over one half of sales in this market, and of the leading 25 products. A high degree of concentration exists within each OTC market segment.

And in this market the leading companies changed in only 5 out of 30 separately identified market segments, and only 50 new products were introduced between 1968 and 1973. Market trends indicate also that the OTC market will be increasingly dominated by the large companies that already can exert considerable marketing power.

Thus concentration ratios that are based essentially on different ways of measuring the size distribution of firms may be a very misleading guide to the intensity of competition. Market positions of competitors may change dramatically within a seemingly stable framework, and the uncertainties that are inherent in product invention and innovation create a climate of competition much more dynamic and powerful than might at first appear. But clearly the dynamic element in competition

products are sold, and in pharmaceuticals this is an important factor. Competition would appear to be a more dynamic process in the market for ethical pharmaceuticals, where the products are supplied as a result of a doctor's prescription, than in the 'over-the-counter' market.

PART I

CHAPTER 1 - GENERAL INTRODUCTION

PART ICHAPTER 1 - GENERAL INTRODUCTION1. PURPOSE

This study is part of a systematic series of studies concerned with the development of concentration in certain industrial sectors of Member States, and with the analysis of the effects of concentration on the structure of product markets and on competition.

In the U.K. the London Business School has studied three industrial sectors: Mechanical Engineering; Pharmaceutical Products; and Photographic Film. This report relates only to Pharmaceutical Products.

2. OBJECTIVES

In Part I, Chapter 2, the report examines the concentration data in the format required for this series of studies. In Part II the report examines the overall competitiveness of the U.K. Pharmaceutical Industry from two main points of view: the marketing process in the industry, as reflected in sample surveys of the prescribing behaviour of doctors, and in the advertising and promotional expenditure of companies in the major product markets; and secondly, the competitiveness of the industry in the 'over-the-counter' retail market. The intention in Part II is to make some general observations on the industry's marketing process and to present the results of empirical work on:

- . The extent to which concentration among the leading brands and manufacturers has remained relatively stable or otherwise over the period 1964 to 1973 in the various therapeutic product categories.
- . The nature and extent of new product introductions, together with some measure of their market success.

In addition to analysing the market structure, the report examines more specifically the interaction between concentration and selected elements of the marketing mix. Little research has been undertaken in this area and therefore the results must be considered as exploratory rather than definitive in nature.

Nevertheless, empirical analysis of promotional expenditure, new products and pricing strategies for a representative sample of therapeutic categories was undertaken with a view to obtaining insights into the following:

- . The effects of patent expiration on price levels.
- . The use of pricing strategy to achieve market share.
- . The use of price, new products and promotional strategies to protect market share.
- . The level of promotional expenditure required to achieve a significant market share for new products.

3. INDUSTRY DEFINITION

The pharmaceuticals industry manufactures and sells products that can be categorised into the following broad classifications:

- (a) Ethical Pharmaceuticals: Products that have to be prescribed by a qualified medical doctor (e.g. penicillin). They may be patented or non-patented products. All ethical products have a generic name describing the ingredients. Many also have a brand name for the purpose of identifying the generic products with a specific manufacturer.
- (b) Over-the-Counter (OTC) Products: Products, usually for common ailments, that do not require a prescription and can be purchased in retail pharmacies, and sometimes other retail outlets, by the consumer. These are sometimes referred to as proprietary products, although some observers of the industry use the word 'proprietary' exclusively for OTC products that have been subject

patent drugs, but this term will not be used to avoid possible confusion with patented ethical products.

- (c) Veterinary Products: Products designed for use in treating animals.
- (d) Bulk Chemicals, Capsules, etc.: Products sold by one manufacturer to another at an intermediate stage in the manufacturing process.

For the purpose of this paper, inquiry has been confined to the markets for ethical and OTC products in the United Kingdom. A number of pharmaceutical companies have diversified into the wider 'health care' field by acquiring companies manufacturing hospital and laboratory supplies and equipment. These are excluded from the definition of the pharmaceutical industry used in this report.

4. DATA SOURCES

The data included in this report have been obtained from (i) a broad background of ongoing work in all areas of pharmaceutical marketing, (ii) certain confidential reports prepared by an international firm of management consultants, (iii) a review of published materials, (iv) in-depth interviews with the marketing management of one pharmaceutical company, (v) analysis of market research reports, and (vi) the annual audited accounts of pharmaceutical companies (used for both Parts I and II).

The market reports mentioned in (v), used only in Part II of this study, are the standard market research sources used by all the major pharmaceutical companies. They are generally regarded as reliable and accurate. A wide range of such reports are published, by Intercontinental Medical Statistics Ltd.(IMS). Those used for this research were:

- . British Pharmaceutical Index, 1964-1973: an annual summary of estimated cash value and percentage market shares for each ethical and OTC pharmaceutical product

marketed in the U.K. Ethical products are divided into 92 therapeutic categories or sub-markets, and OTC products into 30 sub-markets. The reports are based on a monthly audit of 600 retail chemists.

- . Medical Promotion Index 1968-1973: an annual summary of estimated promotional expenditure by product. This relates to the same ethical sub-markets as the British Pharmaceutical Index and summarises data from several sources. It does not cover promotion expenditure on OTC products. The following points should be noted concerning this data:

- The costs of sampling and company-sponsored functions are excluded.
- Journal advertising and direct mail figures are estimates reasonably close to amounts companies actually spend.
- Costs assigned to sales representatives are costed, observations of exposure and impact achieved, and may differ greatly from the amounts actually spent.
- The number of doctors used each month in the sample for one of the data series was 100 up until mid 1971 and 200 thereafter.
- Up to July 1972 the estimated costs of sales representation is likely to be understated since the data is based on a cost-per-call of £2.5 from 1968-1970 and £3.5 for 1971. This was increased to £5.26 per call in July 1972 with a built-in inflation of 6% p.a. thereafter.

The market reports (used in Part II) refer only to products sold through retail pharmacists (in other words, they exclude sales made to hospitals, and all sales of OTC products made to non-pharmacist outlets). This data, therefore, gives a measure of scale only and does not provide information on absolute market size and absolute promotion expenditure. Moreover, a number of companies included in the survey reported as separate companies are operating divisions of the same company, due to recent mergers and acquisitions, but from a marketing point of view are in reality still separate companies (and are registered as such). Their advertising and promotion expenditures are shown separately, their individual company

them as separate entities. So they are also shown as separate companies in this report. Among the top 30 companies, those that have common ownership are:

Glaxo - Allen & Hanbury
 Ciba - Geigy
 Warner Lambert - Parke Davis
 Eli Lilly - Dista
 Beecham - Bencard
 Hoechst - Roussel (as of 1975)

To preserve the obvious confidentiality of this data to the pharmaceutical industry, all references to individual companies and individual products have been coded. In Chapters 2 to 5, companies have been coded alphabetically from A to Z, AA to AZ and BA to BZ, according to their 1973 sales of ethical pharmaceutical products via retail pharmacists. Thus, company A is the industry leader, company Z is the 26th largest company, company AA is the 27th largest, etc. In Chapter 6, which describes competition in the OTC market, companies have been coded alphabetically according to 1973 sales of OTC products. Consequently companies A to Z in Chapter 6 are not the same as companies A to Z in the earlier chapters. Where individual products are discussed these are referred to by company code and a sub-script which indicates the relative importance of that company's product in the therapeutic class under discussion. For example, product R₁ is company R's largest product in a given therapeutic class.

Statistical data relating to 39 'enterprises' over the period 1968-72 that form the basis of Part 1 of this Report are given in Appendix I (Tables A and B).

5. OFFICIAL REPORTS ON THE INDUSTRY

Before commencing our study, we should mention four official publications that also throw light on issues relating to concentration and competition in pharmaceuticals, to which references are made later. These are:

- (a) Report of the Committee of Enquiry into the Relationship of the Pharmaceutical Industry with the National Health Service, 1965-67 (Cmd 3410, September 1967). The terms of reference included

"the structure of the industry, the financial position of the industry, the

- (b) Focus on Pharmaceuticals (National Economic Development Office, HMSO 1972). This also reported on "the structure of the industry", and some of its statistical sources were the same as in this report.
- (c) Beecham Group Limited and Glaxo Group Limited: The Boots Company Limited and Glaxo Group Limited (Monopolies Commission Report, July 1972). This report on the likely consequences to the public interest of the relevant mergers contains also an analysis of the size of firms and R & D in the industry.
- (d) Chlordiazepoxide and Diazepam (Monopolies Commission Report, April 1973). This is a study of whether a monopoly exists in the supply of these products (sold in the U.K. by Roche Products Ltd.), and, if so, whether the prices of these goods are against the public interest.

CHAPTER 2 - CONCENTRATION IN PHARMACEUTICALS

1. DEFINITION OF THE SECTOR

As already stated, data for Part I of this study (the Concentration Study that forms part of the larger series of E.E.C. studies), was derived from the annual audited accounts of companies classified to the pharmaceutical sector (1968-72). Companies were identified using membership lists of the Association of the British Pharmaceutical Industry and the list of the top 50 companies, ranked by sales, is published in the British Pharmaceutical Index. Since collection was done at the company level, it was possible to include the financial variables specified by the Commission: turnover; number employed wages and salaries; net profit before tax; gross cashflow; 'own means' (share capital and reserves); exports. (Basic data are given in Appendix I.)

In line with other E.E.C. studies a 50% cut-off point was used: that is, individual companies are classified as 'enterprises' entirely producing within that sector if 50% or more of their turnover is accounted for by the sales of products classified to that sector. Data was only collected for companies manufacturing in the U.K.; importing companies were excluded in this part of our work.

However, collecting data at company level brings its own problems. For example, the use of a 50% cut-off point for defining an enterprise meant that both Beecham and I.C.I., along with some other major manufacturers such as Fisons and Reckitt & Coleman, could not be included in the 'enterprise' analysis. But such companies were included in 'units of economic activity' where any company (with over 100 employees) making pharmaceutical products would be included as a unit, but only to the extent of its sales of pharmaceuticals. It was possible to do this only for 'turnover', because company accounts do not reveal other information (and even if such data were collected privately, much of it would be very arbitrary). The 'units of economic activity' data should, nevertheless, give a good indication of market concentration.

The pharmaceutical industry covered by this study employed about 56,000 persons in 1971 (in 'enterprises'), with 'enterprise' turnover of about £536 million, as shown in Table 2.1. The 'units of economic activity' (UEA) data showed a turnover of £509 million - rather lower than the Census of Production figure for the same year of £572 million (no employment data was available on a UEA basis). These figures demonstrate that the firms in this study covered a high proportion of the Census defined industry in 1971; and it is relevant to note that in 1968 (the Census year prior to 1971) the correspondence was even closer, as shown in Table 2.1 below.

TABLE 2.1 PHARMACEUTICALS : INDUSTRY COMPARISONS

	<u>Year 1968</u>		<u>Year 1971</u>	
	<u>Turnover</u> (£ million)	<u>Employment</u> ('000)	<u>Turnover</u> (£ million)	<u>Employment</u> ('000)
<u>L.B.S. Study:</u>				
'Enterprises'	380	49	536	56
'UEA'	344	-	509	-
<u>Census of Production:</u>	347	56	572	62

Source: Census of Production and L.B.S. Study.

However, Table 2.1 does not directly reveal the fact that the 'enterprise' definition includes the turnover (and employment) of the non-pharmaceutical activities of companies allocated to the pharmaceutical sector; so while the 'enterprise' data is more statistically accurate, the 'UEA' data is perhaps a better estimate.

Data on the size distribution of employees reveals that, while the Census of Production includes a large number of firms in the industry with less than 100 employees (a size category excluded from our study) they accounted for less than 10% of the total turnover of the industry. Not surprisingly (as Table 2.1 implied) several important companies had to be omitted from the 'enterprise' tables because of their specification (they were important companies in this industry, but turnover in this

TABLE 2.2 PHARMACEUTICALS : INDUSTRY COMPARISONS
SIZE DISTRIBUTION, 1971

<u>Size Class by Employment</u>	<u>Number of Companies</u>		<u>Turnover (£ mill.) Census of Production</u>
	<u>L.B.S. Study 'Enterprises'</u>	<u>Census of Production</u>	
0 - 99	0	219	37.7
100 - 199	3	26	22.7
200 - 399	6	25	78.8
400 - 749	7	17	90.0
750 and over	15	17	343.1
TOTAL	31	304	572.3

Source: Census of Production 1971 and L.B.S. Study.

2. GROWTH OF MAIN VARIABLES

The main results for the years 1968-72 are given in Table 2.3 below. The definitions are the standard ones as required by the E.E.C. Commission. They show that while turnover has increased by 57% during 1968-72, net profits have increased by only 28%

TABLE 2.3 PHARMACEUTICALS : GROWTH DATA

		1968	1969	1970	1971	1972	1972 (1968=100)
UEA:	Turnover (£m)	344	376	448	509	584	170
'Enterprise':	Turnover (£m)	380	423	482	536	598	157
	Wages and Salaries "	54	59	69	78	86	159
	Net Profit "	57	61	62	62	73	128
	Cash Flow "	68	73	75	78	80	118
	Own Capital "	159	177	185	190	220	138
	Exports "	78	95	115	131	145	186
	Number Employed '000	49	51	54	56	54	110

Source: L.B.S. Study

3. CONCENTRATION DATA

Tables 2.4a and 2.4b below give the principal measures of concentration based on turnover for (a) 'Enterprises and (b) 'Units of Economic Activity'. They both exhibit stability in concentration ratios over 1968-72, however measured. There are some changes year to year, but they appear to be very minor.

However the 'enterprise' Table shows a significantly higher concentration than does the 'UEA' Table - the simplest measure of 4-firm concentration ratio being 61% and 40% respectively in 1972. Undoubtedly this is because of the omission of many firms in the 'enterprise' data for the reason already explained.

TABLE 2.4a CONCENTRATION MEASURES : TURNOVER

		<u>'ENTERPRISES'</u>				
<u>Concentration Measures</u>		<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
*4-firm concentration ratio		61	61	61	61	61
*8-firm concentration ratio		77	77	77	77	77
Gini co-efficient		.667	.675	.673	.673	.672
Herfindel Index		150.2	149.1	146.8	145.7	145.3
Entropy		-108.4	-108.7	-109.1	-109.2	-109.2
Co-efficient of Variation		1.87	1.90	1.88	1.88	1.87
Linda Indices	(Ln*m L	.321	.332	.327	.328	.321
	(n*m	22	22	22	22	21
	(Ln < h L	1.11	1.06	1.05	1.05	1.06
	(n < h	3	3	3	3	3

(* concentration ratios rounded to the nearest whole number)

Source: L.B.S. Study

TABLE 2.4b CONCENTRATION MEASURES : TURNOVER

		<u>'UEA'</u>				
<u>Concentration Measures</u>		<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
*4-firm concentration ratio		39	41	40	41	40
*8-firm concentration ratio		56	58	57	58	57
Gini co-efficient		.550	.568	.568	.573	.564
Herfindel Index		67.5	68.3	66.1	65.98	62.6
Entropy		-137.8	-136.6	-137.7	-137.4	-138.5
Co-efficient of Variation		1.35	1.37	1.36	1.36	1.30
Linda Indices	(Ln*m L	.141	.152	.150	.152	.143
	(n*m	30	28	30	30	30
	(Ln < h L	1.33	1.05	.92	.81	.66
	(n < h	2	2	2	2	2
	(

(* concentration ratios rounded to the nearest whole number)

Source: L.B.S. Study.

Concentration measures of 'Enterprise' employment are given in Table 2.5 below. They show in general a falling trend over the period 1968-72, with ratios that are broadly similar in level to those in Table 2.4a on 'Enterprise' turnover.

TABLE 2.5 CONCENTRATION MEASURES : EMPLOYMENT

		<u>'ENTERPRISES'</u>				
		<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
4-firm concentration ratio		63	61	59	59	59
8-firm concentration ratio		78	76	76	75	74
Gini co-efficient		.658	.653	.650	.645	.649
Herfindel Index		158.3	149.4	140.0	140.1	136.8
Entropy		-108.2	-110.6	-112.0	-112.3	-113.3
Co-efficient of Variation		1.94	1.90	1.83	1.83	1.84
Linda Indices	(Ln*m L	.313	.295	.292	.291	.284
	(n*m	23	23	24	22	24
	(Ln < h L	1.41	1.39	1.34	1.26	1.26
	(n < h	2	2	2	2	2
	(

Source: L.B.S. Study

Concentration measures by year for each variable are shown in Appendix II for 'enterprises'. Turnover concentration seems fairly stable, with employment and remuneration showing a decrease over the period. Profits and cash flow show some increase up to 1970, being steady thereafter. Own capital and exports show some increase in concentration.

Merger Activity

Many of the largest firms in the U.K. industry grew historically by internal growth and later by acquisition in the 1950s and early 1960s. In the period 1968-72 there were no mergers or acquisitions of significance. The attempted mergers of Beecham-Glaxo and Beecham-Boots were, however, the most significant events relating to potential structural change. These mergers were referred to the Monopolies Commission, who recommended that they should not be permitted.

Financial Ties and Interlocking Directorships

Some initial exploratory work was done on this but, yielding few concrete results, was abandoned in favour of the more productive assessment of product markets.

Concentration and Pharmaceutical Prices

Finally, in studying relationships between concentration and prices in the U.K. it should be mentioned that the prices of prescription medicines since 1957 have been subject to negotiations under a series of Voluntary Price Regulation Schemes (VPRS) operated between the Department of Health and the industry⁽¹⁾.

The objective of the Department of Health in voluntary price regulation has been to ensure so far as possible that prices are reasonable. The Sainsbury Report⁽²⁾ gives (Para. 158) an estimate that the second VPRS (1961-64) may have achieved direct savings of about £3-8 million with possible indirect savings of up to £3 million per annum. The report concluded (Para. 178) that there were great obstacles to price competition and that the price regulation schemes had serious weaknesses.

(1) For an outline of the Schemes see International Price Comparison, NEDO, 1972.

(2) Report of the Committee of Enquiry into the Relationship of the Pharmaceutical Industry with the National Health Service (Chairman: Lord Sainsbury), HMSO, 1967, Cmnd 3410.

Subsequently, the National Economic Development Office⁽¹⁾ commissioned a report comparing the general level of prices of medicines in U.K. and other countries⁽²⁾. The main conclusion was that the U.K. market was clearly one of the lowest priced in 1970 among the nine countries compared. Other international comparisons of pharmaceutical costs and prices quoted in 'Focus on Pharmaceuticals' also indicate that the U.K. is one of the lowest priced markets⁽³⁾. NEDO also report estimates that the VPRS between 1965 and 1970 had resulted in cost reductions of about £18 million, a national saving of about 10% of drug costs to the National Health Service.

There are two concise indices of costs and prices of pharmaceuticals: these are shown in Table 2.6 below.

TABLE 2.6:

COSTS AND PRICES OF PHARMACEUTICALS

<u>Year</u>	<u>Average Cost per Prescription (pence)</u>	<u>Price Index - Pharma'cal Chemicals</u>	<u>Price Index - Pharma'cal Preparations</u>
1968	57	86.6	99.7
1969	62	87.5	98.3
1970	67	100.0	100.0
1971	76	110.4	103.6
1972	82	107.7	109.1
1973	88	117.6	117.3

Source: ABPI Annual Report 1973/4.

It is also possible to build up from industry sources an historical price series for individual brands. The Sainsbury Report shows an example of this on page 49.

But of course there are great statistical problems in deriving a reliable price series covering a large number of final products when product characteristics and therapeutic effectiveness are changing over time, and generally because of improving quality price indices overstate the true price increases that have occurred. It is partly for this reason we have not attempted to relate measures of overall changes in concentration to overall price indices, but have preferred to study pricing over time in relation to individual products and to competition within therapeutic categories. This is given in Part II of the report.

4. CONCLUSIONS

We conclude from Part I of this study that concentration ratios in the pharmaceutical industry based on turnover have been broadly stable over the period 1968-72, with significantly higher figures for 'enterprises' than for 'units of economic activity', while those based on 'enterprises' employment have been declining over the period.

The purpose of Part II of this study is to explore what the stable concentration ratios look like when viewed in more detail, based on competition between therapeutic classes of products. It will be seen that a very different picture emerges.

PART II

CHAPTER 3 : THE MARKETING PROCESS

PART IICHAPTER 3 : THE MARKETING PROCESS

This section describes the most important features of the marketing process in both the ethical and OTC pharmaceutical markets. This will permit the analysis of Chapters 4, 5 and 6 to be interpreted in a more meaningful manner. It specifically excludes any discussion of the marketing environment such as the incidence of disease and details of the Patents Act, 1949.

The marketing process in the ethical market is governed by the unique situation whereby the doctor prescribes, the patient consumes and the government pays. OTC products, however, which do not require a doctor's prescription before they can be bought by the ultimate consumer, are marketed in substantially the same way as other fast moving consumer goods such as grocery and toiletry products.

According to the industry trade association, sales of ethical pharmaceutical products to the National Health Service were valued at £215 million at manufacturers prices in 1972. The market for OTC products was estimated at £60 million in 1972, although only about half of this volume was sold through retail pharmacists.

1. THE ETHICAL PHARMACEUTICAL MARKET IS NOT GENERALLY PRICE COMPETITIVE

The demand for any given ethical pharmaceutical product is dependent on the incidence of illness, the quality of the drug and its level of promotion.

(1) Doctors Tend to Choose Drugs On Therapeutic Grounds

Even under the National Health Service (NHS) doctors have an extremely wide latitude as to what drug they

prescribe, and in nearly all cases will prescribe what they consider to be the most effective drug to treat the particular symptoms.

The NHS monitors doctors' prescribing habits by comparing the total expenditure of all their prescriptions with the local averages. If a particular doctor is considerably in excess of the average, he will be visited by a NHS official for "a discussion about his prescribing habits". This rarely occurs and is in practice, the only sanction that occurs.

Where two drugs are of approximately equal therapeutic value, the doctor may be influenced by price (if he knows it), but price comparisons are difficult due to different dosage strengths, forms and efficiency.

(2) Price Competition Among Ethical Pharmaceutical Manufacturers Is Not Common, Tetracyclines Being A Major Exception

There is little or no price competition in the ethical pharmaceutical industry. There are two main reasons for this:

- The nature of the consumer precludes price-cutting as an effective marketing strategy
- There are few economies of scale in the production process.

A number of studies have been undertaken both in the US and UK, which have showed that average price levels of pharmaceutical products remained relatively constant during the 1960's^(1,2). With the high rates of inflation

(1) COOPER, M.H. Prices and Profits in the Pharmaceutical Industry, Pergamon Press, 1966, pp. 43-44.

in the last two years, this has changed to some degree as a number of manufacturers have made successful applications to the Department of Health to raise their prices. This has occurred on products, the price of which actually declined in the preceeding years.

The extreme price competition that occurred in the market for tetracyclines after the expiration of the patent on oxytetracycline in 1966 can be regarded as an exceptional situation. Price competition of this nature did not occur in any other market during the period under study. This is discussed in more detail in Chapter 6.

(3) The Government Controls The Absolute Levels Of Ethical Pharmaceuticals Through Its Voluntary Price Regulation Scheme (VPRS)

The VPRS is an informal agreement between the DHSS and the industry's trade association (ABPI). The basic principle of the Scheme is to ensure that the profits of a company's total UK sales to the National Health Service are reasonable. What is reasonable varies according to each company's financial and marketing position, but currently a before tax return on investment of 20%-30% is considered reasonable. If overall profits are excessive the DHSS negotiates price reductions.

With regard to price increases of existing products, manufacturers have to negotiate increases on products with a large turnover within the ceiling of overall reasonable profitability. Companies are free, however, to vary the prices of minor products without reference to the DHSS, but such price variations affect overall profitability and are therefore taken into account indirectly. Under the Scheme, pharmaceutical companies are required to submit annual returns of sales, costs and profits according to an agreed format.

2. ETHICAL PHARMACEUTICALS ARE PROMOTED ESCLUSIVELY TO DOCTORS THROUGH DETAILMEN(1), JOURNAL ADVERTISING, DIRECT MAIL AND SAMPLING AT AN ESTIMATED ANNUAL COST

The ethical pharmaceuticals industry spent about £30 million on promoting its products to doctors in 1972. This is broken down in the following way:

TABLE 3.1: Type of Expenditure

	Value (£ millions)	%*
Representatives	13.5	45%
Literature	5.1	17
Journal Advertising	3.3	11
Administration	3.6	12
Samples	2.4	8
Other	<u>2.1</u>	<u>7</u>
	£30.0	100%

* Percentages based on Sainsbury Report.

For companies with only a short product line, the proportions spent for various forms of promotion are unlikely to be close to the industry average.

(1) Detailmen Are The Most Important Element In The Marketing Mix Of Most Pharmaceutical Companies

All ethical pharmaceutical manufacturers apart from a few small companies with extremely specialised product lines employ detailmen for the primary purpose of

(1) Detailmen is the pharmaceutical industry's term for its

persuading doctors to prescribe their drugs. The detailmen's job has been defined as:

"To promote the use of and to sell ethical drugs and other pharmaceutical products to physicians, dentists, hospitals, and retail and wholesale drug establishments, utilising knowledge of medical practices, drugs and medicines. Informs customers of new drugs, explains characteristics and clinical studies conducted with drugs. Discusses dosage, use and effect of new drugs and medical preparations".⁽¹⁾

In their relationship with doctors, detailmen perform all (or most) of the following functions:

- . Sell- by persuading doctors to write prescriptions for their firm's products.
- . Provide information to doctors concerning new products and new developments relating to existing products. A study by the American Medical Association in 1958 showed that detailmen are the most important source of drug information to doctors⁽²⁾. There is no reason to think the situation is any different in the UK.
- . Distribute samples and product literature to doctors.
- . Provide the company with information relating to side effects discovered by the prescribing doctors.
- . Arrange clinical trials and clinical research as appropriate.
- . Transfer the experiences of one doctor to others (the experiences of colleagues in the profession

(1) US Dept. of Labour, Dictionary of Occupational Titles.

(2) "Attitudes of US physicians toward the American Pharmaceutical Industry". American Medical Association, 1958.

are important to the doctor acceptance of a product).

Besides calling on doctors, most firms have their detailmen call on retail pharmacists, and wholesalers to ensure that they have adequate distribution for their products. If a product, once prescribed by a doctor is not available from local pharmacists, manufacturers soon lose goodwill with the doctor. For these reasons, most manufacturers have extremely liberal return goods policies, particularly on new product introductions. While ensuring distribution is important, calls on pharmacists have a number of other important benefits. These are to:

- . Provide pharmacists with information on new drugs, This is important because pharmacists sometimes advise doctors on what dosage forms and in what strengths new drugs are available; and may inform doctors on the use of drugs together with their indications and contra-indications.
- . Influence pharmacists to fill generically prescribed prescriptions with their products. While approximately 15% of all prescriptions are generically written, a much smaller percentage are filled by generic drugs per se, since only brand name drugs exist in many therapeutic categories.
- . To check pharmacists' inventory both as a service to the pharmacist and for the manufacturers own purposes. This includes reminding them to return products before expiry dates where necessary.

- . To audit prescriptions. This tells the detailmen which doctors are prescribing his products and therefore helps him plan his call schedule.
- . To obtain information on both doctors and competitors.
- . To promote OTC drugs to the pharmacist (where the manufacturer markets these products but does not employ a separate salesforce).

The exact configuration of any given company's detail force depends on the size and nature of the product line. However, most of the larger pharmaceutical companies in the UK (those ranking among the top 40) have between 50 and 70 detailmen calling on doctors and pharmacists. An additional 10-12 are usually involved in field salesforce management. A typical representative makes about 3/4 calls on doctors and 4/5 calls on retail pharmacists each day. Most of the larger companies also employ an additional 5 to 10 representatives to call exclusively on doctors and pharmacists within hospitals. Although hospitals only account for about 16% of total sales volume, they are of relatively greater importance than their volume indicates due to the high proportion of "influential prescribers" generally found in hospitals.

The typical doctor call involves one major detail (selling the merits of one product) and two minor details, as well as leaving literature and samples

to visit doctors about $3/4$ times per year, but in recent years it has become even more difficult for detailmen to talk to doctors. It is now estimated that the average detailman sees a doctor only once out of every 2.5 calls.

(2) Various Forms of Advertising and Promotion Are Usually Included In The Typical Marketing Mix

Along with doctor detailing, most manufacturers use a combination of advertising in professional journals, direct mailing and sampling in an attempt to gain doctor acceptance of their products.

Whereas a detail force is a relatively fixed expense in the short term (at least on the upward size), these additional forms of promotional expenditure are variable in the short term, thus providing some degree of budget flexibility.

In practice there is a considerable degree of disagreement among firms in the industry as to the cost efficiency of the alternative promotional methods discussed in this sub-section. This can be seen from Table 3.2 which shows the percentage of promotional expenditure spent by each of the largest companies on different forms of promotion in 1973.

Journal Advertising: Placing advertisements in journals published specifically for the medical and allied professions is an important means of promoting ethical drugs. It is particularly used by small companies, and for establishing and enhancing the reputation of a firm and its products. It can reach many doctors at low cost and can make other forms of advertising more effective by familiarising doctors and pharmacists

TABLE 3.2:

BREAKDOWN OF
 PROMOTIONAL EXPENDITURE OF
 TEN LARGEST ETHICAL
 PHARMACEUTICAL MANUFACTURERS
 1973

<u>REPRESENTATIVES</u>	<u>JOURNAL</u>	<u>DIRECT MAIL</u>	<u>TOTAL</u>
55%	29%	16%	100%
58	30	12	100
46	50	4	100
60	23	7	100
32	48	20	100
46	44	10	100
58	32	10	100
35	62	3	100
42	47	11	100
58.	29	13	100

- Direct Mail: Direct mail advertising is used for disseminating important selling points about products as well as to obtain requests for samples and to obtain more complete and detailed information on certain products. It has the advantage of being fast and precise; and may, if it is of the inquiry seeking variety permit measurable results to be obtained. The cost of each direct mail piece tends to be greater than the corresponding cost per doctor impression in a journal, but can be more cost effective depending on the quantity and purpose of the mailing. The major criticism against direct mail stems from the huge quantity of literature received by doctors on a daily basis. It is unlikely that more than 10% of doctors read all advertising received, although as many as 70% might glance briefly at what they receive.
- Sampling: Depending on the product, sampling can be a useful element in the promotional mix. For widely prescribed drugs of well known efficacy (e.g. broad spectrum antibiotics), sampling appears to have little influence on doctors' prescribing habits. Many companies have probably over spent on sampling in recent years, although there is no empirical evidence to support this.

Sampling is not confined to ethical products and so manufacturers that also sell a range of OTC drugs (e.g. antacids, mild laxatives, etc.) often utilise doctor sampling.

In terms of value, the three types of promotion discussed above account for the vast majority of promotional expenditure. However, four other types of expenditure are noteworthy:

- Films - both general and product specific
- Convention exhibits
- Pens, pads and "give-away" items
- Doctor meetings and symposia.

The last category - doctor meetings - has become an increasingly important means of communicating with doctors since 1969. In 1969 it was estimated that 132,000 doctors attended meetings whereas in 1974 this had

(3) Promotional Expenditure Varies Considerably Both By Product Group And By Company

While overall industry promotional expenditure as a percent of sales is about 15%, this varies considerably between the various therapeutic product categories.

In 1973 for example - a typical year - promotional expenditure as a percent of sales varied from zero to 42%. The largest therapeutic categories showed considerably less variation as shown in Table 3.3:

TABLE 3.3:

<u>Therapeutic Category</u>	<u>Promotional Expenditure as % of Sales</u>	
	<u>1968</u>	<u>1973</u>
Broad spectrum antibiotics	6.6%	8.9%
Systemic anti-inflammatories	4.7%	5.7%
Bronchodilators	8.5%	6.5%
Diuretics	4.7%	5.2%

It should be pointed out that the above percentages only reflect the competitive situation at the time. For example, it is likely that the percentages in the anti-inflammatory market increased substantially after 1973 as a large number of new products were introduced.

For the 50 leading pharmaceutical companies competing in the ethical drug market, promotional expenditure as a percentage of sales varied in 1973 from 2% for one of the most prominent companies to 999% for a new company trying to enter the ethical pharmaceutical industry for the first time. These percentages did not vary significantly over the period 1968-1973. A few of the very small companies, particularly those just entering the U.K. market, spent money on promotion in excess of sales value.

3. BESIDES PROMOTION, MOST COMPETITION OCCURS THROUGH THE INTRODUCTION OF NEW PRODUCTS CAPABLE OF GAINING DOCTOR ACCEPTANCE

Besides total promotional effort (detailing, advertising and other promotional expenditures), the introduction of new and improved products is the key to obtaining market penetration in the ethical pharmaceutical industry.

Where a patented product is a major therapeutic advance unrivalled by better "substitute" products, it can maintain a strong market position for a prolonged period of time, but most patented products have a product life cycle of no more than 6-10 years. After allowing for the fact that it now takes from 3 to 5 years after the patent has been granted before the product can be marketed, one can see that many products reach the peak of the life cycle before the 16 year patent protection afforded by the 1949 Patents Act expires. A typical example of a new product strategy to replace a patented product whose rate of sales growth has started to decline was the introduction in 1972 of Amoxil by Beecham's Bencard division to extend the product life cycle of the semi-synthetic penicillins.

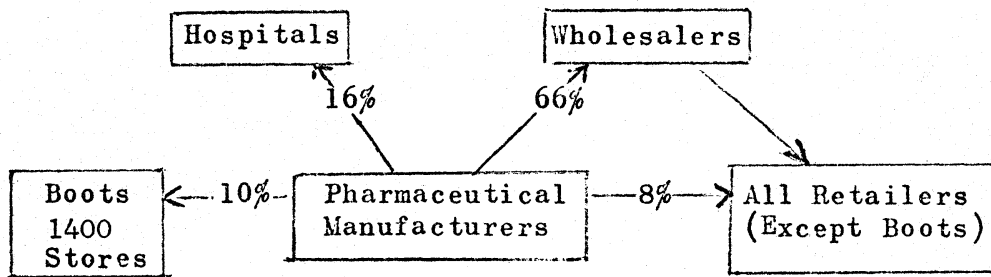
Where products do not have patent protection - as with penicillin and streptomycin, for example - product variations have been extensively used to extend the life cycle of individual products⁽¹⁾. Further discussion of the extent of new product introductions is postponed to Chapter 4.

(1) This was noted by Comanor in the US (Economica 1964) and applies equally to the UK.

4. ABOUT TWO-THIRDS OF ALL ETHICAL PHARMACEUTICALS IN THE UK ARE DISTRIBUTED VIA WHOLESALERS TO THE 11,500 RETAIL CHEMISTS

(1) The Typical Pharmaceutical Manufacturer Sells Direct Only To The Major Retail Chemist Chains

The following diagram indicates the major channels of distribution for a medium-sized pharmaceutical manufacturer and the percentage of its domestic sales revenue that passes through each channel:



The percentage going to hospitals is likely to vary between companies according to its product line. However the central importance of wholesalers in the chain of distribution is evident in all companies.

(2) Retailers Receive A Dispensing Fee And A Maximum Price For Each Drug From The National Health Service

The pharmacist is obliged to stock those products listed in the formulary. He is re-imbursed a maximum price for each product, plus a fee of about 10% to cover overheads, a dispensing fee (at the time of writing) of £ 0,24, and a small payment for the container.

The main ways in which pharmacists control their margin is by taking advantage of quantity discounts offered by manufacturers and filling generically written prescrip-

(3) The Number Of Retail Stores Has Declines By 20% Since 1955
And Is Expected To Continue To Do So In The Near Future

The past 20 years have seen a decline in the number of retail pharmacies in England and Wales from over 15,000 in the mid 1950's to 12,500 in 1970. This number is estimated to have declined to 11,500 in 1974, and is projected to fall to about 10,000 in 1980-85.

After the advent of the National Health Service in 1948 there was a sharp increase in the number of pharmacies, as the volume of prescriptions rose sharply; but the decline over the last twenty years has occurred in spite of an increased volume of prescriptions in the 1960s.

TABLE 3.4:

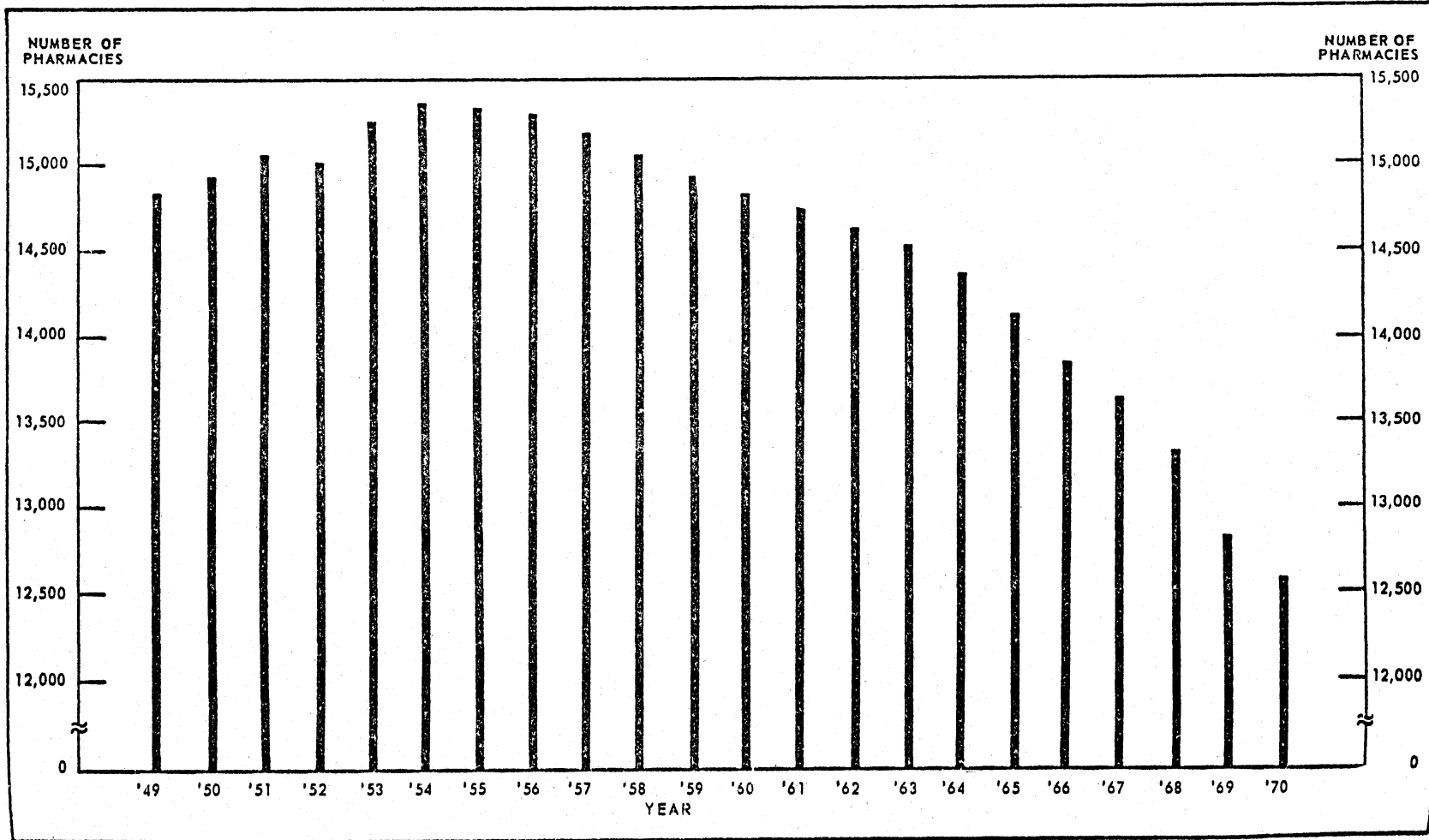
<u>YEAR</u>	<u>STORES</u>	<u>Prescriptions Handled</u> (in Millions)
1937	13,000	65
1949	14,848	202
1957	15,192	207
1967	13,618	271

Source: D.H. Maddock unpublished dissertation, 1970.

Chart 3.1 shows graphically the trend in the number of pharmacies in the U.K.

CHART 3.1

TREND IN THE NUMBER OF PHARMACIES IN GREAT BRITAIN



5. THE MARKETING OF OTC PRODUCTS DIFFERS SUBSTANTIALLY FROM THAT OF ETHICAL PHARMACEUTICALS

(1) All The Leading OTC Products Are Heavily Promoted

No OTC product has patent protection. Manufacturers compete with each other using all the marketing variables at their disposal.

The nature of the products and the competition in the market require companies to use both "push-through" and "pull-through" marketing techniques. Push-through techniques aim to sell products to the retailer or wholesaler and therefore include marketing variables such as incentive discounts, whereas pull-through marketing is designed to create consumer demand. In-store merchandising and special promotion offers are key elements in the marketing process of these products, and may have both push-through and pull-through characteristics.

(2) OTC Products Are Characterised By Multi-Channel Distribution

Grocery Stores (particularly the larger ones), department stores and discount stores have become increasingly important channels of distribution for OTC products in addition to the traditional retail pharmacy outlets. Generally, however, it is only the fast moving products (i.e. the heavily advertised brands with the largest sales volumes) that are sold in these channels. This is because the concept of inventory turnover is significantly more important for grocery and discount stores

The existence of these additional channels has major repercussions on the marketing strategies of the manufacturers primarily because separate salesforce from that calling on retail pharmacists is usually necessary.

(3) Doctor-Recommended OTC Products Are Rarely Promoted Direct To The Consumer

By their nature, a few OTC products tend to be doctor-recommended (or pharmacist recommended) products. Certain laxatives and antacids for example, fall into this category. These products may be detailed to doctors, and prescriptions may be written for them at the doctor's discretion. Doctor-recommended products are rarely advertised to the consumer since many doctors refuse to recommend advertised products. Companies generally have a choice of which strategy they wish to follow.

(4) The Different Characteristics Of The OTC Market Are Recognised In The Organisations Of The Competing Companies

Although six of the ten leading companies in the OTC market are also among the ten leading companies in the ethical pharmaceutical market, the internal organisations of these companies reflect the different market conditions for ethical and OTC products. Manufacturers have either created separate divisions for their OTC products (e.g. Beecham and Burroughs-Wellcome) or have created separate companies as have Pfizer and Smith Kline & French:

<u>PARENT CO.</u>	<u>NAME OF PHARMACEUTICAL SUBSIDIARY</u>	<u>NAME OF OTC SUBSIDIARY</u>
Pfizer	Pfizer Ltd.	Unicliffe Ltd.
Smith, Kline & French	S.K.F. Laboratories Ltd.	Menley & James Ltd.

CHAPTER 4 : COMPETITION IN THE
ETHICAL PHARMACEUTICAL MARKET

This chapter measures the market concentration among the leading brands and manufacturers in the UK pharmaceutical industry, and the extent to which these levels have remained relatively stable over the period from 1964 to 1973.

The data source used for this analysis was the British Pharmaceutical Index 1964-1973 already described in Chapter I. As this report only covers sales through retail chemists, the market shares do not include sales to hospitals. Also excluded from the market share totals are sales of generic products, but these only account for 5% of industry sales volume. Only in three of the 30 largest therapeutic classes does the total of generic sales exceed 10% of the total. These are non-narcotic analgesics (14%), cough remedies (16%) and anti-systemic hormones (19%).

The measure of market share used to measure concentration for both companies and brands was cash value market share of branded products. Different results may have been obtained if the volume of prescriptions written had been taken as the measure. Due to the relatively high volume of generic prescriptions in some therapeutic categories which are in fact filled by branded products (because no generic product is available), cash value was considered to be a more meaningful measure.

The separate market segments in the pharmaceutical industry are probably better defined than in many other industries with the result that the cross-elasticity of demand between the various therapeutic markets is low. This does not mean however that the market boundaries are clearly delineated. Indeed, some products are marketed in more than one therapeutic class and not all products within the same therapeutic class are direct competitors. Thus, in the market for broad-spectrum antibiotics there are three distinct sub-markets; the cephalosporins, the tetracyclines and the semi-synthetic penicillins. While each of these sub-classes treats the same basic symptoms, the manufacturers make different claims for each product group and charge widely different prices. Furthermore, market boundaries are dynamic - a fact not often recognised - and many companies seek, as part of their overall marketing strategy, to make new claims for their products over time (product differentiation), thereby continually shifting their market segment and trying to create a unique market niche.

While all therapeutic classes were reviewed the fourteen leading therapeutic classes which accounted for 61.8% of industry volume in 1973 have been analysed in greater detail. These classes, together with an indication of their relevant importance are summarised in Table 4.1. Each has a 1973 sales value in

TABLE 4.1:

FOURTEEN LEADING THERAPEUTIC
PRODUCT CLASSES
RANKED ACCORDING TO 1974
SALES VOLUME

<u>THERAPEUTIC CLASS</u>	<u>PERCENTAGE OF INDUSTRY SALES(1)</u>
BROAD SPECTRUM ANTIBIOTICS	9.5%
SYSTEMIC ANTI-INFLAMMATORIES	6.8
BRONCHODILATORS	6.4
OTHER HYPERTENSIVES	5.5
DIURETICS	5.1
NON-NARCOTIC ANALGESICS	4.5
ANTI-DEPRESSANTS	4.0
TRANQUILLIZERS	4.0
*ANTI-ANGINA	3.1
PLAIN SKIN HORMONES	3.0
COUGH REMEDIES	2.9
*PLAIN ANTACIDS	2.5
*CONTRACEPTIVES	2.5
*NON-BARBITURATE SEDATIVES	2.1
	<hr/>
Sub-total	61.9%
78 OTHER THERAPEUTIC CLASSES	38.1
	<hr/>
TOTAL	100.0%
	<hr/>

(1) Industry sales are those estimated to occur through retail chemists only based on audit. Hospitals are excluded, as are sales of non-branded ethical products

* Indicates that therapeutic class did not appear among leading 14 classes in 1964.

1. NO SMALL GROUP OF MANUFACTURERS OR PRODUCTS
DOMINATES THE ENTIRE MARKET

(1) The Ten Largest Companies Accounted For 32% of
Industry Sales in 1964 and 43% in 1973

The concentration of market power among the ten leading companies in the industry increased significantly between 1964 and 1973.

.2: Companies ranked according to annual sales volume	Cumulative percent of total ethical pharmaceutical market		
	1964	1968	1973
Top 5	20.6%	29.3%	26.6%
Next 5	32.2	40.1	43.2
Next 10	60.3	64.2	66.3
Next 10	72.7	69.7	71.3
Next 10	78.1	76.8	81.1
Next 10	81.3	83.9	85.8
All Other	100%	100%	100%

The share of the market held by the largest company varied between 6.1% and 9.4%.

(2) The Percentage of The Total Market Held By the
Leading Brands Remained Relatively Stable Between
1964 and 1973

The concentration levels of leading brands have remained relatively constant:

.3: Products ranked according to annual sales volume	Cumulative Percent of total ethical pharmaceutical market		
	1964	1968	1973
Top 5	14.9%	16.4%	14.0%
Next 5	21.9	22.5	21.5
Next 10	31.4	31.2	30.8
Next 10	37.9	37.3	36.8

2. WITHIN EACH OF THE INDUSTRY'S MAJOR MARKET SEGMENTS AN OLIGOPOLISTIC STRUCTURE EXISTS

While the overall levels of concentration in the ethical pharmaceutical market are not high, most of the therapeutic market segments are dominated by no more than two or three manufacturers. In some instances these manufacturers have more than one brand with which they maintain market dominance.

(1) The Market Shares Held By The Leading Companies In Each Therapeutic Market Did Not Change Significantly Between 1964 and 1973

Table 4.4 shows the degree of market concentration among the leading companies for the 30 largest therapeutic categories, both for 1964 and 1973. Comparisons between the two sets of data indicate that there has been no significant shift in the degree of concentration in the industry during the period under study:

Comparison of the market leaders showed that:

- In fifteen therapeutic classes there was an increase in concentration and in fourteen there was a decrease.
- In 13 of the 30 categories, market shares changed by over ten percentage points.
- In the 14 largest categories, the degree of

TABLE 4.4:

 DEGREE OF CONCENTRATION
 IN 30 LEADING
 THERAPEUTIC CATEGORIES
 1964 AND 1973

(1)	THERAPEUTIC CLASS	MARKET LEADER		TOP TWO CO.		TOP FOUR CO.	
		1964	1973	1964	1973	1964	1973
	BROAD SPECTRUM ANTIBIOTICS	39%	42%	72%	58%	99%	80%
	SYSTEMIC ANTI-INFLAMMATORIES	80	40	92	64	98	88
	BRONCHODILATORS	32	42	46	72	63	82
	OTHER HYPERTENSIVES	62	67	94	82	98	91
	DIURETICS	51	40	61	62	75	80
	NON-NARCOTIC ANALGESICS	29	30	49	55	68	70
	ANTI-DEPRESSANTS	39	23	63	44	89	61
	TRANQUILLIZERS	45	53	61	66	88	83
	ANTI-ANGINA	34	63	54	80	74	93
	PLAIN SKIN HORMONES	44	53	76	77	88	87
	COUGH REMEDIES	41	42	55	62	66	69
	PLAIN ANTACIDS	31	34	45	48	68	65
	CONTRACEPTIVES	23	33	40	65	65	82
	NON-BARBITURATE SEDATIVES	34	72	59	86	86	95
	PERIPHERAL VASODILATORS	42	31	60	61	75	80
	SYSTEMIC ANTIBIOTICS	41	32	64	62	86	90
	HAEMATINICS	26	31	35	60	51	81
	ANTI-NAUSEANTS	55	34	74	61	91	82
	PENICILLINS	26	26	42	46	69	74
	ANTI-INFECTIVE SKIN HORMONES	17	23	34	41	64	59
	ANTI-OBESITY PREPARATIONS	23	60	45	79	77	94
	LAXATIVES	31	30	47	54	72	70
	ACTH-SYSTEMIC HORMONES	27	20	53	37	76	60
	ORAL DIABETIC	57	44	91	65	99	93
	PARKINSON ANTICONVULSANTS	41	40	76	66	87	89
	ANTISPASMODICS	35	16	54	31	73	54
	SYSTEMIC ANTIHISTAMINES	30	24	55	48	83	66
	TB PREPARATIONS	40	34	71	64	86	95
	ORAL COLD PREPARATIONS	44	53	68	74	92	90
	OTHER VITAMINS	60	40	76	66	93	92

(1) Ranked according to 1973 sales volume.

A comparison of the concentration ratios of the top four companies in each therapeutic class between 1964 and 1973 indicates that there were approximately as many increases as decreases in concentration. No noticeable differences exist, however, between the larger and smaller therapeutic categories.

(2) There Appears To Have Been An Increase In The Degree of Market Fragmentation Among The Minor Brands Between 1964 and 1973

While degrees of concentration have remained relatively static, the total number of brands has increased by 15%, primarily during the period 1964 to 1968.

<u>TABLE 4.5:</u> <u>DATE</u>	<u>TOTAL NUMBER OF BRANDS</u>	<u>TOTAL NUMBER OF SIGNIFICANT BRANDS*</u>
1964	1109	1028
1968	1265	1086
1973	1274	934

* For the purpose of this section only, a significant brand is one having a market share greater than 0.5%.

While the total number of brands has increased, the number of significant brands has decreased such that in 1973, 934 brands with market shares of 0.5% or greater supported 340 brands with smaller market shares. This indicates that there has been increased fragmentation at the "bottom-end" of the market: a similar finding to that of a study undertaken in the U.S.A. (1)

The 14 leading therapeutic classes have been chiefly responsible for the increase in the total number of brands. From Table 4.6 it can be seen that between 1964 and 1973, the total number of brands increased by 58%. During this same period the number of significant brands increased by only 13%, with the result that

TABLE 4.6:

NUMBER OF BRANDS COMPETING
IN TOP 14 THERAPEUTIC
CATEGORIES 1964, 1968 and 1973

THERAPEUTIC CLASS	TOTAL NO. OF BRANDS				TOTAL NO. OF BRANDS WITH MARKET SHARE > 0.5%			
	1964	1968	1973	Diff. 1964/73	1964	1968	1973	Diff. 1964/73
BROAD SPECTRUM ANTIBIOTICS	19	32	45	+26	12	22	22	+10
SYSTEMIC ANTI-INFLAMMATORIES	8	14	20	+12	7	10	14	+ 7
BRONCHODILATORS	26	32	44	+18	13	26	18	+ 5
OTHER HYPERTENSIVES	13	15	18	+ 5	8	8	10	+ 2
DIURETICS	20	27	30	+10	20	20	19	- 1
NON-NARCOTIC ANALGESICS	27	34	37	+10	27	28	22	- 5
ANTI-DEPRESSANTS	17	23	29	+12	15	17	19	+ 4
TRANQUILLIZERS	16	21	29	+13	13	14	20	+ 7
ANTI-ANGINA	15	16	18	+ 3	13	13	10	- 3
PLAIN SKIN HORMONES	14	19	24	+10	13	11	16	+ 3
COUGH REMEDIES	29	35	38	+ 9	23	30	22	- 1
PLAIN ANTACIDS	24	28	33	+ 9	20	23	25	+ 5
CONTRACEPTIVES	16	27	28	+12	15	20	14	- 1
NON-BARBITURATE SEDATIVES	11	13	11	-	11	7	7	- 4
TOTALS	255	336	404	+149	210	249	238	+28

by 1973, 41% of all brands in these 14 categories had market shares of 0.5% or less. In the balance of the market - among the 78 smaller therapeutic classes that comprise 38% of industry volume - only 20% of the brands had market shares of 0.5% or less in 1973. The direction of the trend over the period under study however has been the same, as is indicated by the table below.

TABLE 4.7:

PERCENTAGE OF BRANDS WITH MARKET SHARE
OF 0.5% OR LESS

<u>YEAR</u>	<u>14 LEADING THERAPEUTIC CATEGORIES</u>	<u>78 SMALLER THERAPEUTIC CATEGORIES</u>
1964	17%	4%
1968	26%	10%
1973	41%	20%

Some significant differences in the degree of fragmentation that has occurred among minor brands exist between different therapeutic classes. For example, in the market for broad-spectrum antibiotics, patent expiration on oxytetracycline in 1966 caused a flood of new market entrants, many of which were successful in achieving a small market share in this large market. In other markets however, there was a reduction in the number of significant ($\frac{1}{2}\%$) brands in spite of large increases in the number of brands.

In contrast to the trends in the number of brands described above, the number of companies competing in the top 14 therapeutic categories remained static between 1964 and 1968, and increased by 14% between 1968 and 1973. This is shown in Table 4.8.

TABLE 4.8:

NUMBER OF COMPANIES COMPETING
IN TOP 14 THERAPEUTIC
CATEGORIES 1964, 1968 AND 1973

<u>TOP 14 THERAPEUTIC CLASSES</u>	<u>1964</u>	<u>1968</u>	<u>1973</u>	<u>INCREASE 1973 OVER 1964</u>
BROAD SPECTRUM ANTIBIOTICS	6	10	16	+ 10
SYSTEMATIC ANTI-INFLAMMATORIES	5	5	7	+ 2
BRONCHODILATORS	16	12	10	- 6
OTHER HYPERTENSIVES	4	4	6	+ 2
DIURETICS	10	10	12	+ 2
NON-NARCOTIC ANALGESICS	11	14	12	+ 1
ANTI DEPRESSANTS	8	9	13	+ 5
TRANQUILLIZERS	7	9	10	+ 3
ANTI-ANGINA	10	10	6	- 4
PLAIN SKIN HORMONES	7	8	9	+ 2
COUGH REMEDIES	13	9	13	-
PLAIN ANTACIDS	14	14	17	+ 3
CONTRACEPTIVES	7	8	8	+ 1
NON-BARBITURATE SEDATIVES	9	5	6	- 3
TOTAL	<u>127</u>	<u>127</u>	<u>145</u>	<u>+ 18</u>

3. THE LARGEST COMPANIES ALL HOLD STRONG MARKET POSITIONS IN ONE OR MORE OF THE LARGEST THERAPEUTIC CATEGORIES

(1) The Leading Companies Have Strong Market Positions In One Or More Therapeutic Classes

Table 4.9 shows the number of therapeutic classes in which each of the 30 leading companies rank among the top four companies. The data shows that:

- All companies rank among the top 4 companies in from three to sixteen therapeutic classes. The median number of classes in which a company ranks among the top four is six.
- All companies rank among the top two in from one to nine therapeutic classes. The median is four.
- Eight companies (six of which rank among the top 10 companies) rank among the top 4 companies in more than 10 therapeutic classes.

(2) The Ten Largest Companies All Hold Dominant Market Positions In At Least One of The Top 14 Therapeutic Classes

The 28 leading companies in 1973 (shown later in Table 4.15) competed in at least two of the top 14 therapeutic classes; however for a company to rank among the largest in the industry - in the top 10 for example - it needs to have a dominant market position in at least one of the large therapeutic classes. The matrix in Table 4.10 shows those therapeutic classes in which each of the fifteen leading companies are the market leaders, and/or have products with market shares totalling more than 10%. The six largest companies have the leading position in eight of the ten

TABLE 4.9:TOP 30 COMPANIES PARTICIPATING
IN DIFFERENT THERAPEUTIC
CLASSES (1973)

<u>COMPANY</u>	<u>NO. OF THERAPEUTIC CLASSES IN WHICH COMPANY RANKS</u>	
	<u>IN TOP 2</u>	<u>IN TOP 4</u>
A	5	8
B	5	10
C	3	3
D	7	9
E	7	11
F	6	11
G	5	14
H	9	11
I	3	4
J	8	10
K	3	4
L	3	7
M	2	4
N	7	9
O	8	11
P	5	8
Q	4	10
R	1	3
S	3	6
T	2	5
U	2	5
V	3	5
W	2	5
X	1	6
Y	2	8
Z	4	6
AA	2	3
AB	6	9
AC	4	5
AD	3	5

TABLE 4.10:

DOMINANT MARKET POSITIONS
HELD BY 15 LEADING COMPANIES
IN TOP 14 THERAPEUTIC
CLASSES IN 1973**

COMPANIES***	Antibiotics	Anti-Inflammatories	Bronchodilators	Other Hypertensives	Diuretics	Non-Narcotic Analgesics	Psychostimulants	Tranquillizers	Anti-Angina	Anti-Infective Skin Hormones	Cough Remedies	Antacids	Oral Contraceptives	Sedatives
I		42%*												
II	24%													
III		30%												
IV	15%													
V				40%*										
VI										13%				
VII										42%*				
VIII	40%*		67%*	22%		23%*								
IX							53%*							72%*
X	41%*													
XI								63%*	25%					
XII					30%*									
XIII									53%*					
XIV			15%					17%						
XV	16%													

* Indicates leading company in therapeutic class.

** Participation of company only shown if market share exceeds 10%.

*** New rankings used to protect data confidentiality.

(3) The Success Of Individual Companies Is Dependent On Obtaining Between One and Three Leading Products

Table 4.11 shows the number of products which each of the 15 leading companies have among both the top 25 and top 50 products. The data shows that:

- . No company has more than four products.
- . 21 out of 25 of the leading products are marketed by 12 of the 15 leading companies.
- . All manufacturers have at least one major product.

The importance of one or a few products to any one company is illustrated by the example of Pfizer and Lederle in the list of leading companies. In 1964 Pfizer was the largest company in the U.K. ethical pharmaceutical market, and Lederle was second. Lederle had the largest product on the market and the sixth largest product, while Pfizer had the second largest product. With these three products, the two companies are reported to have controlled over two-thirds of the large, broad spectrum antibiotic market. The introduction of a new product by ICI (Imperacin), coupled with the expiration of patent protection, caused these companies' products to lose market share rapidly. By 1973 none of the three products ranked among the top 50 products. As for the companies, neither ranked among the top 15 companies.

TABLE 4.11:NUMBER OF LEADING PRODUCTS
BY COMPANY (1973)

<u>Leading Companies</u>	<u>Number of Products</u>		<u>TOTAL</u>
	<u>Among Top 25 Products</u>	<u>Among Products ranked 26-50</u>	
A	4	-	4
B	3	-	3
C	1	2	3
D	3	1	4
E	-	3	3
F	1	1	2
G	1	2	3
H	1	-	1
I	2	-	2
J	1	-	1
K	1	1	2
L	-	2	2
M	1	-	1
N	-	1	1
O	2	-	2
All other manufacturers	4	12	16
	<u>25</u>	<u>25</u>	<u>50</u>

4. WITHIN EACH MARKET SEGMENT THE LEADING BRANDS AND COMPANIES CHANGED SIGNIFICANTLY BETWEEN 1964 AND 1973

Although an oligopolistic market structure exists in each of the therapeutic classes, analysis of the individual brands indicates that the market dominance of any one product is relatively short-lived. The market dominance of any one company also tends to be short-lived although a few companies have been able to introduce successful replacement products to maintain their market dominance⁽¹⁾.

(1) Market Leadership Changed In 20 Out Of The Top 30 Therapeutic Classes Between 1964 and 1973

Table 4.12 shows for each of 1964, 1968 and 1973, the leading companies in the 30 largest therapeutic categories. Analysis indicates that:

- . There were twice as many changes in market leadership in the five year period from 1964 to 1968 in the top 14 therapeutic classes than there were in the following five year period, 1968 to 1973.
- . More than one change in market leadership occurred in only five classes, and in two of these the company that was dominant in 1964 had regained by 1973 the market leadership that it had lost in 1968.
- . In one third of the classes, the dominant position of the market leader did not change over the nine year period,

TABLE 4.12:CHANGE IN MARKET LEADERS
BETWEEN 1964 AND 1972 IN 30
LARGEST THERAPEUTIC CLASSES

THERAPEUTIC CLASS (ranked according to 1973 sales)	NUMBER OF CHANGES IN MARKET LEADERSHIP	
	<u>1964-69</u>	<u>1968-73</u>
1 Broad Spectrum Antibiotics	1	-
2 Systemic Anti-Inflammatories	1	-
3 Bronchodilators	-	1
4 Other Hypertensives	-	-
5 Diuretics	1	-
6 Non-Narcotic Analgesics	-	-
7 Anti-Depressants	1	-
8 Tranquillizers	-	-
9 Anti-Angina	1	1
0 Plain Skin Hormones	1	-
1 Cough Remedies	-	-
2 Plain Antacids	1	-
3 Contraceptives	-	1
4 Non-Barbiturate Sedatives	1	1
5 Peripheral Vasodilators	-	-
6 Systemic Antibiotics	1	-
7 Haematinics	1	-
8 Anti-Nauseants	-	-
9 Penicillins	1	1
0 Anti-Infective Skin Hormones	-	1
1 Anti-Obesity Preparations	1	-
2 Laxatives	-	-
3 Acth-Systemic Hormones	-	-
4 Oral Diabetic	-	-
5 Parkinson Anticonvulsants	1	1
6 Antispasmodics	-	-
7 Systemic Antihistamines	1	1
8 TB Preparations	-	1

When the top four companies in each therapeutic class in 1964 and 1973 are compared, less change is evident. 57% of the companies that comprised the top four in 1964 were still among the top four in 1973.

(2) Changes In Company Rankings Between 1964 And 1973 Provide Inconclusive Evidence

To assess the overall competitive movement within the industry, the first five companies in each of the 14 leading therapeutic classes were ranked (by cash value market share) for each year from 1964 through to 1973. Each change in ranking was regarded as one change (such that if two companies changed position, that would count as two changes). Actual movements between the years was then taken as a percentage of the possible number of changes. The results are shown below.

TABLE 4.13:

COMPANY RANKING CHANGES BETWEEN ADJACENT YEARS FOR TOP 14 THERAPEUTIC CLASSES

	<u>Actual No. of changes</u>	<u>Possible No. of changes</u>	<u>Actual as % of possible</u>
1964/65	18	70	25.7%
1965/66	28	70	40.0
1966/67	33	70	47.1
1967/68	24	70	34.3
1968/69	17	70	24.3
1969/70	29	70	41.4
1970/71	25	70	35.7
1971/72	17	70	24.3
1972/73	16	70	22.8

Cooper undertook a similar analysis covering all 92 therapeutic classes for the period 1961-64, and noted "a marked decline in the competitive interchange from 50% between 1960 and 1961 to 33% in 1963/1964"⁽¹⁾. By taking a longer period, such a conclusion appears less easy to substantiate.

5. OVER 400 COMPLETELY NEW PRODUCTS WERE INTRODUCED BETWEEN 1964 AND 1973

The extent of new product competition and the success of new products provides a useful measure of the degree of competitiveness of a market. This section presents the results of analysis undertaken to determine how many new products were introduced into the UK market together with some measure of their market success during the period 1964 to 1973.

No clear definition of exactly what is a new ethical pharmaceutical product exists. For the purposes of this study, only those products appearing as new brand names in the market research reports are regarded as new products. This definition obviously excludes improvements to existing products, and does not count as a new product new form or dosage strength of an existing products

(1) The Rate Of New Product Int. n Appears To Have Slowed Down Since the .960's

The 1950's and early 1960's was a period of unprecedented new product activity in the pharmaceutical industry. During this period pharmaceutical remedies were discovered for many of the common diseases, but as major research breakthroughs became harder to obtain (as in the field of cancer for example), the rate of new product introductions has slowed down.

The following table gives an indication of how

TABLE 4.14:

<u>Year</u>	<u>Number of New Branded Products Introduced That Gained Market Share of 1.0% or More</u>
1965	37
1966	44
1967	38
1968	45
1969	47
1970	21
1971	30
1972	25
1973	<u>18</u>
	<u>305</u>

The above table should be interpreted cautiously since the most recently introduced products have had less time to achieve a 1.0% market share, coupled with the fact that it has become more difficult to obtain even a small market share⁽¹⁾. However, since most new products achieve their maximum market penetration in under two years⁽²⁾, the sudden drop after 1969 is fairly significant. The exceptionally high level of product introductions from 1966 to 1969 is due in large measure to the expiration of the patent on oxytetracycline in 1966.

(2) Most New Product Introductions Have Been Concentrated In The Larger Therapeutic Classes

The top 14 therapeutic classes accounted for 235, or 57% of all new product introductions between the beginning of 1965 and the end of 1973. This high degree of new product activity is commensurate with the total importance of these classes in the market: in 1973 they accounted for 62% of industry sales.

As might be expected by far the largest number of new brands have been introduced in the broad spectrum antibiotic market and in the oral contraceptive market. The expiration of the patent on oxytetracycline in 1966 caused a large influx of new brands (30) into that market. In the market for oral contraceptives, rapid product development occurred as manufacturers and the medical profession learned more about this relatively new field of pharmaceuticals, and 28 new products were introduced.

There is substantial variation between other therapeutic classes as to the number of new brands introduced. No correlation appears to exist between the number of new brands introduced and either the size of the therapeutic markets or their average growth rates over the past five years. Large numbers of new brands appear both in rapidly growing and declining therapeutic classes, and vice versa. Only in one of the top 30 therapeutic classes - Anti-obesity Preparations - have no new brands been introduced.

(3) 28 of the Top 30 Companies Moved Into New Therapeutic Classes
Between 1964 and 1973

Among the top 30 companies, the introduction of products into therapeutic classes where they had not previously competed tended to be heavily concentrated in the larger therapeutic classes.

There is little or no correlation between company size and the number of new brands introduced or new markets entered. Among the 30 top companies - ranked according to 1973 sales of ethical pharmaceuticals in retail chemists - the number of brands introduced varies between one (for company M) and 16 (for company F). The average is eight. Similarly, entry by companies into new therapeutic classes varies widely, between none for company M and ten for company U. It is of interest that the largest company throughout the whole period (company A) entered only one new therapeutic class.

(4) Only One-Third Of The 407 New Products Introduced Obtained A Market Share of 5% Or More

The following table shows the number of new products that achieved the following market shares in their respective therapeutic class from 1964 to 1973:

<u>TABLE 4.15</u>	<u>Market Share Achieved</u>	<u>Number of Products</u>
	Over 15%	49
	10.0 - 14.9%	22
	5.0 - 9.9%	70
	1.0 - 4.9%	164
	Under 1%	102
		<hr/>
		407
		<hr/>

Analysis of new product introductions into the top 14 therapeutic classes (which account for 57% of all new product introduction) indicates that it is considerably more difficult to obtain a 5% market share in these classes. Of the 141 products obtaining a 5% market share only forty (28%) achieved this in the 14 largest therapeutic classes. This finding supports that of section 2.2 of this chapter which indicated that it is considerably more difficult to obtain a reasonable market share in the larger sub-segments. Table 4.16 shows the forty new products that achieved at least a 5% share, and shows their market share and its value for 1973.

Some analysis of which companies have introduced the successful products is shown in Table 4.17. This shows the market shares obtained by the 30 largest companies for their new products, both by existing market and by new therapeutic class. From this it can

- More companies failed to achieve market shares of 5.0% on introducing new products into their existing markets than when they introduced new products into therapeutic classes where they had not previously competed. One possible explanation for this is that when a pharmaceutical company enters a new therapeutic class it is more likely to have a product which represents a major research breakthrough than if it is introducing an improved product in its existing markets.
- The larger companies tended to be more successful in introducing new products than the smaller companies - particularly in new therapeutic classes. Of the 26 new products introduced by the ten largest manufacturers into new therapeutic classes, 10 achieved market shares in excess of 15% and 3 of between 5% and 15%.

TABLE 4.16:

NEW PRODUCTS ACHIEVING A
MARKET SHARE GREATER THAN 5%
IN MAJOR THERAPEUTIC CATEGORIES

THERAPEUTIC CLASS	% Market Share	Value of Market Share (range in emillions)	No. of years to achieve 5% share
BROAD SPECTRUM ANTIBIOTICS	16.3	3.5-4.0	2
	2.8	0.5-1.0	2
SYSTEMIC ANTI-INFLAMMATORIES	24.3	3.5-4.0	1
	39.6	6.0-6.5	1
	6.4	0.5-1.0	1
	9.1	1.0-1.5	3
BRONCHODILATORS	6.6	0.5-1.0	2
	21.4	3.0-3.5	2
	47.3	6.0-6.5	1
DIURETICS	17.3	2.0-2.5	2
NON-NARCOTIC ANALGESICS	9.2	0.5-1.0	4
ANTI-DEPRESSANTS	4.8	< 0.5	2
	6.4	0.5-1.0	5
	5.4	< 0.5	4
	5.5	< 0.5	7
	1.9	< 0.5	2
	6.2	0.5-1.0	2
	4.6	< 0.5	2
	9.0	0.5-1.0	2
	6.6	0.5-1.0	3
	TRANQUILLIZERS	5.0	< 0.5	3
ANTI-ANGINA	16.9	1.0-1.5	2
	24.7	1.5-2.0	2
	38.2	2.5-3.0	2
PLAIN SKIN HORMONES	5.1	< 0.5	1
	5.0	< 0.5	3
	4.5	< 0.5	5
COUGH REMEDIES	8.2	0.5-1.0	2
	11.6	0.5-1.0	2
	9.5	0.5-1.0	2
PLAIN ANTACIDS	9.2	0.5-1.0	3
CONTRACEPTIVES	-		2
	12.4	0.5-1.0	3
	3.9	< 0.5	2
	19.8	1.0-1.5	1
	23.3	1.0-1.5	2
	10.4	0.5-1.0	2
	9.8	0.5-1.0	4
NON-BARBITURATE SEDATIVES	71.1	3.0-3.5	2

TABLE 4.17:

MARKET SHARES OF NEW PRODUCT
INTRODUCED INTO 30 LARGEST
THERAPEUTIC CLASSES
1965-1973

Companies (ranked according to 1973 sales volume)	Existing Markets			New Therapeutic Classes			Total
	<5%	5.0-14.9%	>15%	<5%	5.0-14.9%	>15%	
A, B, C	3	5	2	3	-	3	16
D, E, F	9	5	-	2	1	2	19
G, H, I	8	-	2	6	-	4	20
J, K, L	11	1	1	6	3	2	24
M, N, O	7	2	-	4	1	-	14
P, Q, R	13	1	-	4	3	-	21
S, T, U	6	2	2	12	1	-	23
V, W, X	9	1	-	5	2	-	17
Y, Z, AA	5	4	-	4	1	-	14
AB, AC, AD	-	-	1	3	1	1	6
TOTAL	71	21	8	49	13	12	174

(6) Most Successful New Products Take Two Years Or Less To Achieve A 5% Market Share

The following table shows that 70% of all new products that achieved a 5% market share in the top 14 therapeutic classes did so in under two years.

TABLE 4.18

<u>No. of years required to obtain 5% market share</u>	<u>No. of products</u>
1	7
2	21
3	6
4	3
5+	3
	<hr/>
	40
	<hr/>

Since the market share data for the year of introduction covers a full twelve month period and many of the products were not introduced until the latter half of the year, the above table is more likely to overstate than understate the amount of time required.

Analysis of the highly successful new products - those that eventually obtained a market share in excess of 15% - in Table 4.16 indicates that none of the thirteen new products in this category took longer than two years to achieve a 5% share.

For a "typical" product, the rapid initial market penetration is followed by a peak market share, which then declines at varying speeds but usually considerably more slowly than it initially grew. Analysis of the products that were introduced during the three year

or before indicated that 46% of all new product introductions achieved their maximum market penetration within three years of their date of introduction:

TABLE 4.19:

Market Penetration of New Products*
Introduced 1965-67

<u>No. of years after introduction to achieve maximum market penetration</u>	<u>No. of products</u>
1	7
2	21
3	27
4	11
5	13
6	17
7	3
8	1
9	1
Market share still increasing	18
	<hr style="width: 10%; margin: 0 auto;"/>
	119
	<hr style="width: 10%; margin: 0 auto;"/>

* Only products that achieved 1% market share in 1973 or before.

6. THE EFFECT OF PATENT EXPIRATIONS ON MARKET SHARES HAS ONLY BEEN BOTICEABLE IN THE ANTIBIOTIC MARKET

Up to the end of 1973 there were few patent expirations on products holding dominant market positions. Furthermore many products are covered by multiple patents and multiple patent expiration dates.

(1) In The Broad Spectrum Antibiotic Market The Introduction of Semi-Synthetic Pencillins Had More Impact On Market Share Than Patent Expiration

The expiration of the patent on oxytetracycline in 1966 is the best known example of patent expiration in the U.K. pharmaceutical industry. By the time of patent expiration, Beecham's semi-synthetic penicillin, ampicillin (Penbritin), is estimated to have achieved a market share approximately equal to that of the leading products of both Pfizer and Lederle. The introduction by I.C.I. of a branded oxytetracycline (Imperacin) on the day of patent expiration, at a substantially reduced price, undoubtedly hastened the reduction of the leaders' market share, but at no point did this new product achieve a substantial market share. Generically, neither of Lederle's products were oxytetracyclines, but in terms of therapeutic effectiveness they were substantially similar, and therefore suffered the same fate as Pfizer's products.

Other introductions of oxytetracycline products were considerably less successful, and are generally believed not to have achieved market shares in excess of 2%.

(2) Most Other Patent Expirations Have Had Little Or No Effect On Market Shares Due In Part To The Low Level of Generic Prescribing Of The Products Concerned

In addition to oxytetracycline, there have been patent expirations on a number of other leading products between 1966 and 1973. Table 4.20 shows the market share histories of five products in four different therapeutic classes before and after patent expiration.

TABLE 4.20

<u>Therapeutic Market</u>	<u>Market Share (1964)</u>	<u>Market Share At Expiration</u>	<u>Market Share 3 Years After Expiration</u>	<u>Expiration Date</u>
Psychostimulants	33%	24%	14%	1970
Sedative-anquillizers	15	7	5	1969
Antianquillizers	8	2	2*	1971
Anti-stamines	17	19	18	1966
Antibacterial	71	68	43	1966

* 1973 market share

Examination of the individual products and their markets indicates that:

- . Most products that lost market share after patent expirations were already beginning to lose their market position before patent expiration. The first two products in Table 4.20 are classic examples of this, although even with the leading product in the urinary antibacterial market a superior competitive product was introduced just prior to patent expiration.
- . Patent expiration does not necessarily mean the loss of market share as is evidenced in the market for anti-histamines.
- . A large number of new generically equivalent products do not usually enter the market after patent expiration. Those that have entered the market have not usually been successful. In the market for urinary antibacterials, one company was able to enter the market with a generically equivalent product before patent expiration, but never gained a market share greater than 2.9% .

One of the key factors that determines the extent to which new generically equivalent products are successful in gaining market share from a product whose patent has expired, is the level of generic prescribing of the product concerned. Where there is a low level of generic prescribing, patent expiration is less likely to be associated with a loss of market share due to an influx of new generically equivalent products.

In the case of the urinary antibacterial product (and its generic equivalents) more than 15% of prescriptions are written generically, and in the tranquillizer and anti-depressant markets, virtually no generic prescriptions are written. This contrasts sharply to the

CHAPTER 5 : INTERACTION BETWEEN CONCENTRATION
AND MARKETING IN THE ETHICAL PHARMACEUTICAL MARKET

Marketing strategy can be defined as a set of principles (or decision rules) that adjust the firm's marketing mix to react to environmental changes over time, where the marketing mix refers to "the amount and kinds of marketing variables a firm is using at a particular time to stimulate company sales"⁽¹⁾. The major marketing variables used in the ethical pharmaceutical industry are limited by the nature of the product and market to:

- Promotion (selling, advertising, direct mail, sampling etc.)
- Price
- New product introductions

Other variables commonly used in the marketing mix, such as decisions relating to channels of distribution are the same for all manufacturers in the UK ethical pharmaceutical industry. These are excluded from consideration in this chapter.

Most of the research that has been undertaken to date on the interaction between concentration and marketing strategy has looked for a simple correlation between concentration and advertising promotion on an inter-industry basis⁽²⁾. One such study has been

(1) Kotler, P. Marketing Management 1967, Prentice-Hall, p. 266-67.

(2) See for example: Telser L.G., "Advertising and Competition" Journal of Political Economy 1964.
Mann, H, Henning J, and Meehan J, "Advertising and Concentration: An Empirical Investigation", Journal of

undertaken on a cross-sectional basis between the various therapeutic markets in the UK pharmaceutical industry⁽¹⁾. In an attempt to progress beyond this type of analysis, this chapter introduces a broader framework for analysing the possible inter-relationships and measures certain selected relationships within the limits of the available data.

1. NO SIMPLE CORRELATION EXISTS BETWEEN CONCENTRATION AND SELLING EXPENDITURE

The relationship between advertising and market concentration has been for decades a subject for debate and analysis. The debate has been stimulating and productive, the analysis less so. It is worth recalling the main propositions of the debate and the outcome of the analysis.

Traditional theory suggests that product differentiation can give sellers some discretion in their pricing policies. Whether this results in profits over and above a normal rate of return on capital remains to be established. In addition, the incentive to advertise is stronger in oligopoly than under monopoly. A priori reasoning, however, does not indicate whether the levels of advertising or profits are higher under monopoly or oligopoly.

The principal question raised by theory is that heavy advertising may lead to increased market concentration and the possibility of super-normal profits. The mechanism by which this might begin is through economies of scale in advertising and the erection of entry barriers.

Statistical investigations of this relationship between advertising and concentration have hardly been conclusive. Scherer⁽²⁾ in summarising the evidence concludes:

"the net observed effect of advertising on concentration is a weak one surrounded by considerable variance."

The issue is clouded by a methodological problem: does advertising lead to concentration, or is an oligopolistic structure more conducive to advertising rivalry than a competitive industry structure?

The 'barriers to entry' argument allows a restatement of the advertising-competition hypothesis in terms of advertising-profits. Where entry is easy, profits through differentiation can be competed away by

(1) W.D. Reekie, "The Economics of Innovation with Special Reference to the UK Pharmaceutical Industry", 1971, Ph.D. thesis published by ABPI.

(2) F.M. Scherer, "Industrial Market Structure and Economic Performance", 1970, Ph.D. thesis published by MIT.

new entrants. Moreover, high advertising may be used defensively resulting in a negative effect on profits. With high entry barriers, however, possibly arising through some combination of research and advertising costs, then firms may consistently earn monopoly profits.

The definitive study here is by Comanor and Wilson⁽¹⁾. They found a positive and statistically significant relationship between the advertising/sales ratio and return on stockholders' equity over 43 common goods industry groups, taking into account capital requirements, productive scale economies, and concentration in the market. Industries with high advertising expenditure were found to command profits roughly 50% higher than the average (i.e. 12% return on equity other than 8% for 1954-57). These results provide fairly strong support for the hypothesis that advertising is an important source of monopoly profit. However, it is fair to say that the majority of studies have provided very inconclusive evidence - possibly due to data limitations and occasionally due to faulty methodology.

In the context of pharmaceuticals, the dominant features seem to be:

- . Research expenditure leads to improved and new brands.
- . Very little price competition.
- . Intense rivalry in selling expenditures.
- . Highly oligopolistic structure in therapeutic classes.

In these conditions simple correlations between advertising/sales ratios and concentration are very likely to be uninformative. In a published Ph.D. thesis⁽²⁾ Reekie does indeed find low correlations. These findings do not, of course, prove that no causal relationship exists: it is simply that none can be identified statistically.

(1) W. S. Comanor and T. A. Wilson, "Advertising, Market Structure, and

2. A COMPLEX PATTERN OF CAUSE AND EFFECT RELATIONSHIPS
EXIST BETWEEN CONCENTRATION AND VARIOUS ELEMENTS
OF THE MARKETING MIX

While no direct relationship exists between concentration levels and the sales/promotion ratio, the nature of competition in the individual therapeutic categories is still likely to have an effect on most marketing decisions. Decisions relating to new products, product pricing and levels of promotional expenditure cannot be made, particularly in an oligopolistic market, without regard to the strengths and weaknesses of competitors. In turn, these marketing decisions - which in aggregate make up firms' marketing strategies - also affect the levels of economic concentration. The inter-relationship of concentration and marketing strategy should thus be viewed in both directions. For this reason, the possibility with which individual cause and effect relationships can be identified and measured is limited.

Where an oligopolistic market structure exists, as in most therapeutic classes, two to three companies will usually have a large market share and the rest of the market will be fragmented among many small competitors with low market shares. The event that determines whether a company's products achieve a high or low market share is whether or not it obtains doctor acceptance;

an event which itself is a function of the level of promotional expenditure at the time of product introduction and the inherent therapeutic quality of the drug. The quality of the drug vis-a-vis existing competitors is, in turn, a function of the quality and direction of the firm's research and development efforts.

Having obtained a given market share, the market share is in itself likely to be one of the factors that determine, or at the very least act as a constraint on marketing decisions. This flow of relationships is shown in Chart 5.1. It indicates that where a company obtains a high market share in a given therapeutic class, this will lead to high profits with the result that the company will be able to:

- . Support high levels of promotional expenditure to defend its market position.
This means high barriers to market entry, which in turn reinforces high levels of concentration.
- . Spend huge sums on promoting new products in new therapeutic classes as well as those in which it already has a strong market position. This increases the likelihood of gaining doctor acceptance, obtaining a high market share and reinforcing the oligopolistic nature of the market.
- . Support a large research and development

Where a company obtains only a low market share, the reverse situation occurs. There is some evidence from a study in the United States that companies having products with low market shares tend to use price reduction strategies to increase their share of the market.⁽¹⁾ This appears to hold true in the United Kingdom, and has therefore been included in Chart 5.1.

The rest of this chapter will discuss in greater detail, and quantify where the available data permits, the major inter-relationships discussed in this section.

(1) Confidential Consulting Report, Roger Allen &

3. ACHIEVING SIGNIFICANT MARKET SHARES FOR NEW PRODUCTS REQUIRES LARGE INITIAL PROMOTION EXPENDITURES

To determine the relationship, if any, between the market share obtained by new products and promotional expenditure, all products that were introduced during the four years from 1968-1971, and obtained a 15% market share by 1973 were analysed. In addition, all products introduced in the same years into the top 14 therapeutic categories and achieving a market share of between 5% and 15% were analysed.

(1) Entrants Achieving At Least 15% Market Shares Typically Incur 29% Of Market Promotion Expenditure In The Initial Years

While the brands had different patterns of promotional mix (i.e. the allocation of expenditure to detailing, journals, direct mail), each marketer conducted intensive promotion campaigns during the brand's first three to four years on the market.

With only one exception, all brands incurred a share of marketing expenditures well in excess of share of market sales in the start-up years. The level of promotional expenditure was so high that only 5 out of 22 brands succeeded in reducing their promotional expenditure to average market levels (as indicated by share of promotions equalling share of sales) within three years of entering the market. The following table shows the relationship between average promotional expenditure (expressed as a percent of total therapeutic

class promotion expenditure) and market shares during the first four years after product introduction:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Promotional Expenditure(%)	27%	32%	29%	24%
Market Share(%)	7%	19%	24%	24%

Brands that achieved market shares of between 5% and 15% did not promote as intensively as those achieving market shares of 15% or more. However in most cases the share of promotions well exceeds sales share in the initial years. This is indicated by the following table:

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Promotional Expenditure(%)	12%	14%	11%	9%
Market Share (%)	3%	6%	10%	8%

Chart 5.2 shows comparative sales and promotion expenditure shares for the two groups of successful manufacturers. Chart 5.3 shows promotion and sales patterns for four successful new products, two of which (products A and C) are in the same therapeutic class.

(2) High Promotion Levels Are By Themselves Insufficient To Gain High Market Share

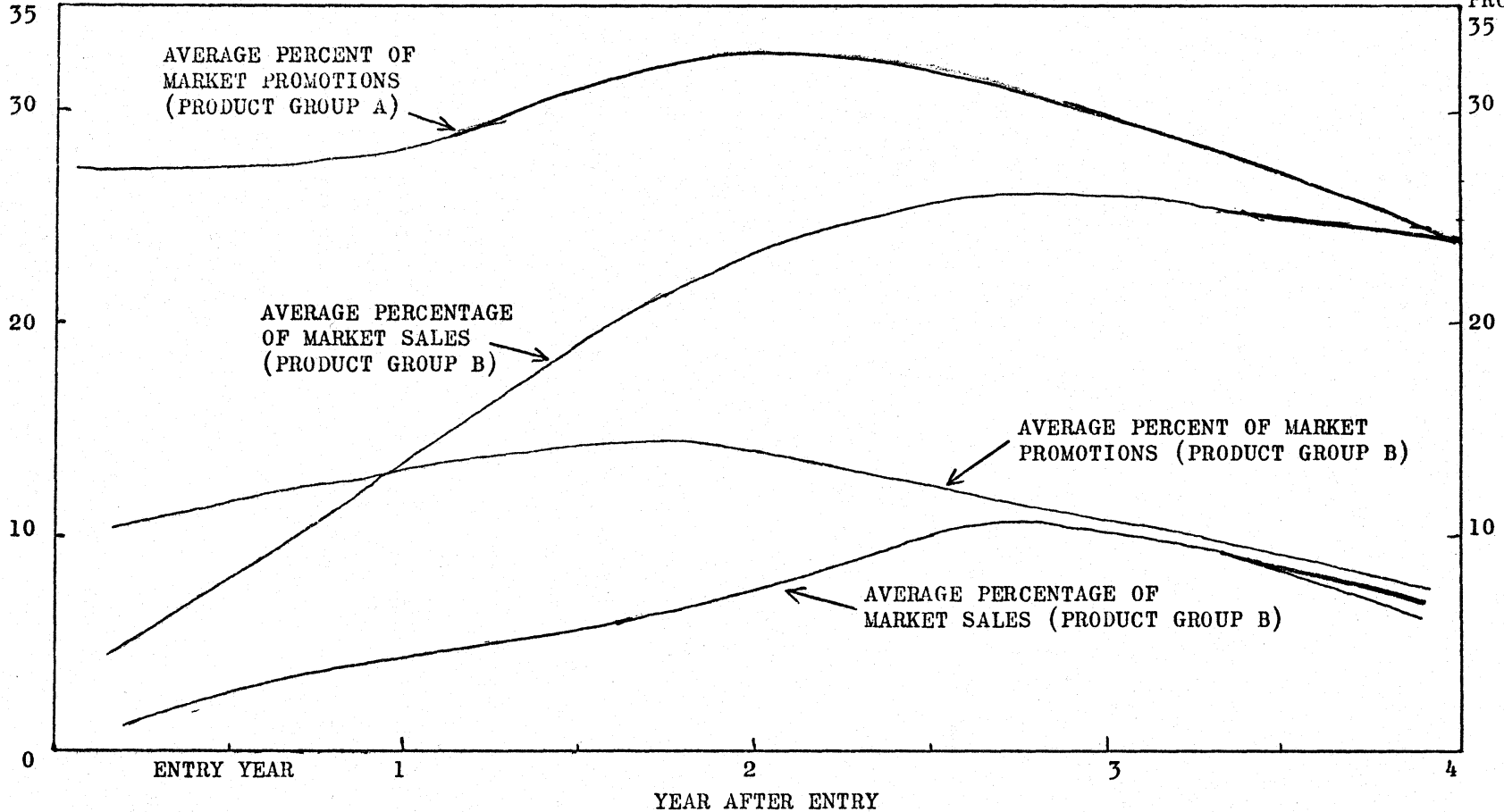
While a strategy of incurring promotion expenditures at a high level is required to achieve a significant market share within a 3-to-4 year period after entry, it does not guarantee success. Many of the products that failed to achieve market shares of 5%, or even 1%, incurred shares of market promotion expenditures well in excess of share of sales during

CHART 5.2:

COMPARATIVE SALES AND
PROMOTION EXPENDITURE SHARES
FOR GROUPS OF SUCCESSFUL
MANUFACTURERS

PERCENT OF
MARKET SALES

PERCENT OF
MARKET
PROMOTION



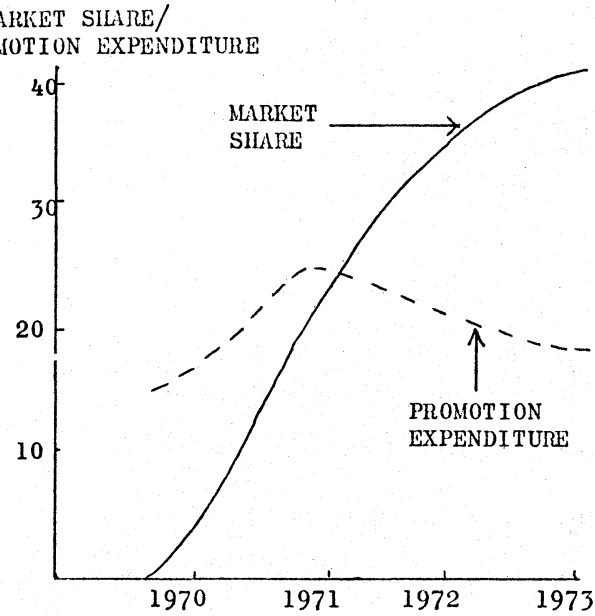
PRODUCT GROUP A - Brands achieving 5% or Greater Market Share

PRODUCT GROUP B - Brands achieving 1% to 5%

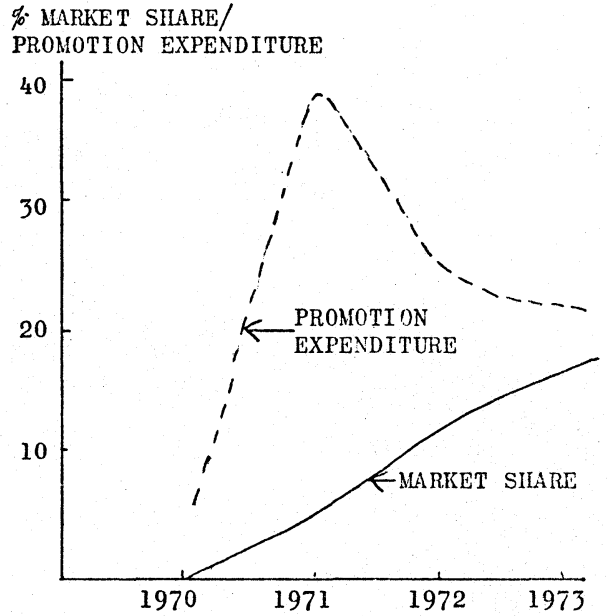
CHART 5.3:

PROMOTION AND MARKET SHARE LEVELS OF SUCCESSFUL NEW PRODUCTS

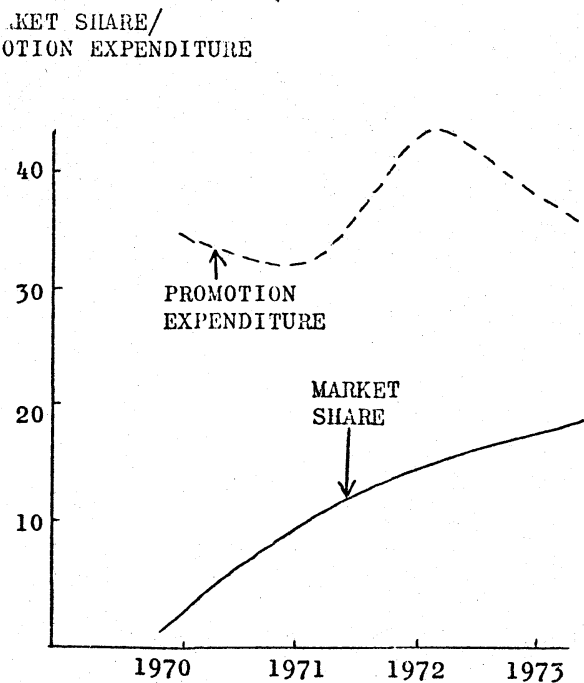
PRODUCT A



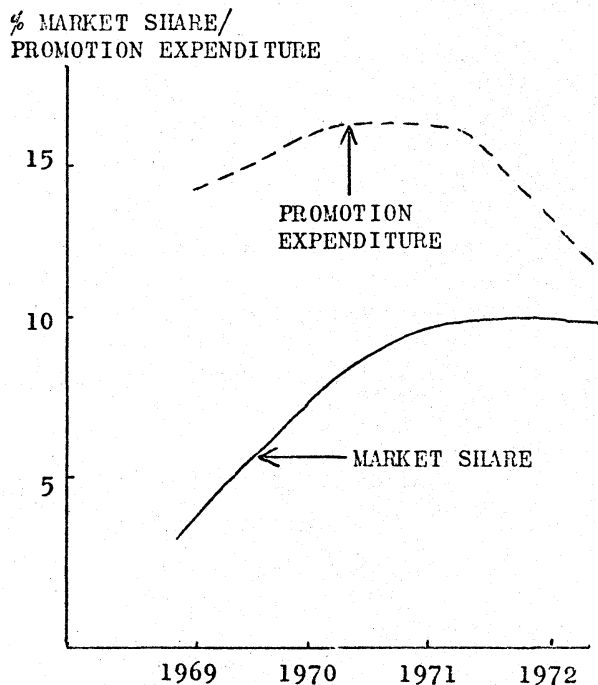
PRODUCT B



PRODUCT C



PRODUCT D



incurred promotion expenditures that exceeded the absolute levels of sales during the three year period. Among the products that currently look as though their sales will fail to reach their levels of promotion expenditure are three new entrants into the market for combination topical steroids:

<u>BLE 5.1:</u>	<u>TOTAL SALES</u>	<u>TOTAL PROMOTION EXPENDITURE</u>	<u>MONTHS SINCE INTRODUCTION</u>
Product 1	£90,000	£94,000	24
Product 2	£18,000	£36,000	12
Product 3	£57,000	£179,000	18

For each therapeutic class, there appears to be a threshold level of promotional expenditure below which the manufacturer (or brand) is so marginal that his marketing message is drowned out by competing marketing messages. If a company's promotion of a product is below this minimum level, the fact that its share of market promotion expenditure is in excess of its market share is unimportant. This is illustrated by the fact that where promotional expenditure exceeded 20% of market promotion expenditure for each of three years, all but a few brands in minor therapeutic classes (e.g. dermatological scalp products) achieved market shares of at least 15% of sales.

(3) The Required Levels Of Promotion Expenditure Act As Significant Barriers To Market Entry

Using the levels of promotion expenditure required to launch a successful new product, minimum promotional requirements can be estimated for each of the therapeutic classes. To obtain a 15% market share in each of the

10 therapeutic classes with the highest absolute levels of promotion expenditure in 1973, this is estimated to have varied between £51,000 and £560,000 per year for each of three years. The mean for all ten classes was £249,000, an increase of 111% over the mean level in 1968. The barriers in these largest market segments are unlikely to be higher than in the remaining segments since these ten therapeutic classes account for approximately the same percentage of promotion expenditures as they do of total industry sales.

4. THE DEVELOPMENT OF REPLACEMENT PRODUCTS HAS BEEN SUCCESSFULLY USED BY SOME COMPANIES TO PROTECT HIGH MARKET SHARE POSITIONS

There are a number of examples in the ethical pharmaceutical industry where companies have developed and marketed substitute products to attract the sales of its own threatened brand. This is a defensive marketing strategy and relies heavily on the goodwill that the company has developed with doctors for providing effective products in a given therapeutic class. Examples of such new product strategies have occurred in the following four therapeutic classes:

Therapeutic Class

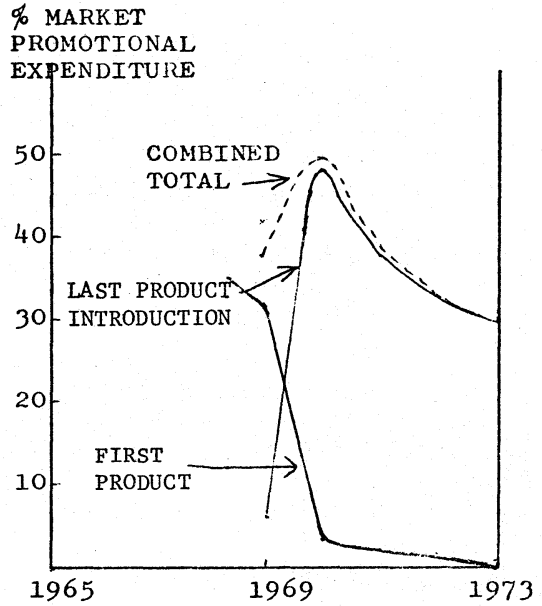
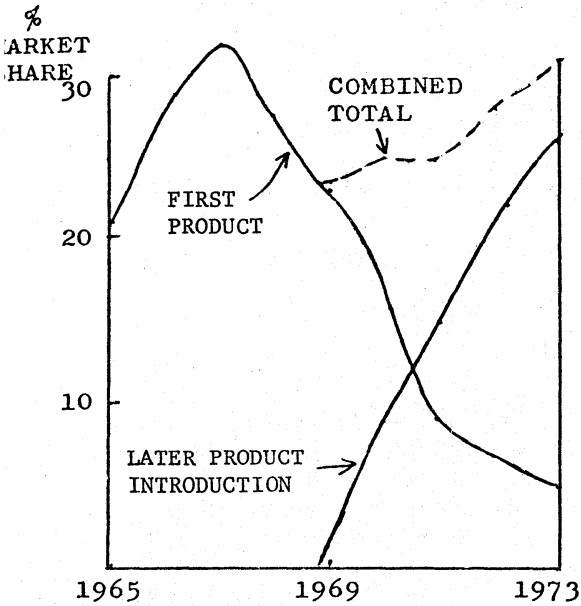
Psychostimulants
 Medium/Narrow
 Spectrum Anti-
 biotics
 Penicillins
 Non-narcotic
 analgesics

As a practical tool with which to defend market share positions, the development of new products appears to be most effective where the threatened brand has a high market share, and where high promotional expenditure is used to launch the replacement product. For example, one company in the market for medium and narrow spectrum antibiotics was successful in transferring its promotional support from one product to another in 1970. This is shown in Chart 5.4.

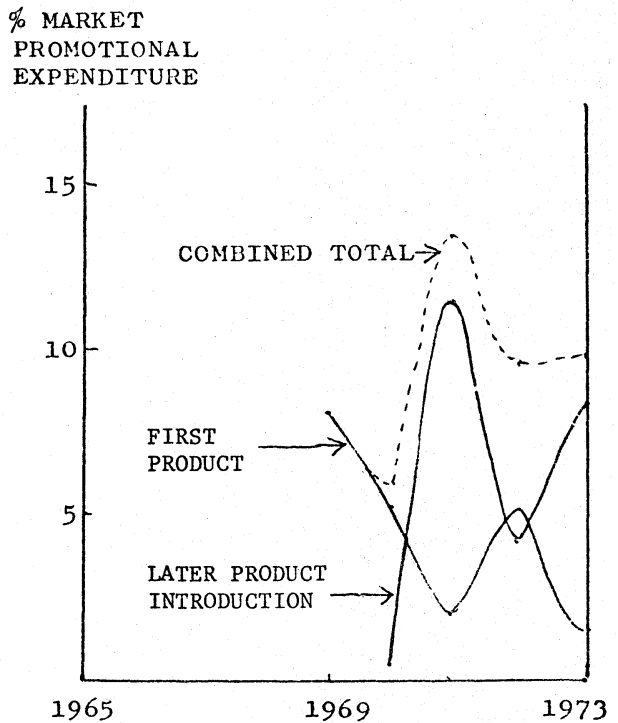
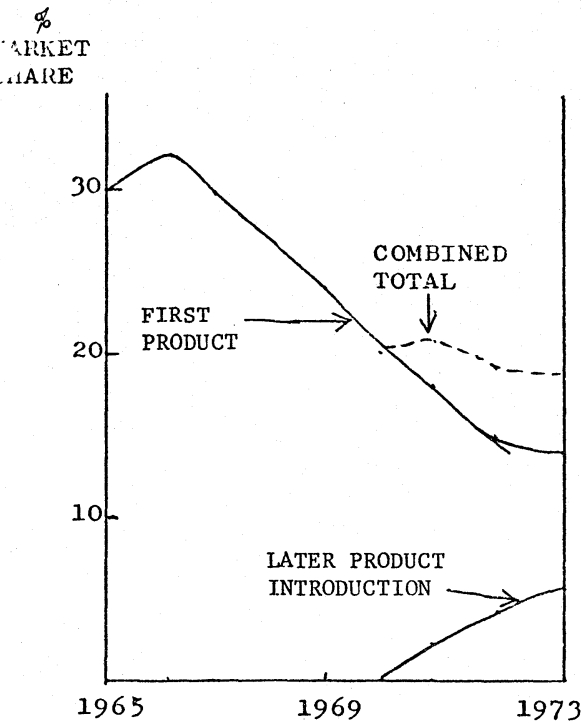
CHART 5.4:

SELECTED PATTERNS OF REPLACEMENT PRODUCT CATEGORIES

MEDIUM/NARROW SPECTRUM ANTIBIOTICS :



PSYCHOSTIMULANTS :



important - both of which are illustrated by one company's comparatively unsuccessful attempt to replace its leading product in the market for psychostimulants. In this case, promotional expenditure in the first full year after introduction was only 11.5% of the sub-market total, and declined thereafter. Furthermore by the time the second product was introduced, the first product's market position had already been declining for 3 to 4 years due to competition from another company's product. This is also shown in Chart 5.4.

In the penicillin market - where there has never been any patent protection - the continual introduction of new products has been an important means of maintaining market position.

5. PRICE REDUCTION STRATEGIES HAVE NOT GENERALLY BEEN EFFECTIVE IN ACHIEVING LARGE MARKET SHARES

As was explained in Chapter 3, the ethical pharmaceutical market is not generally price competitive. However, examples of price reductions being used to gain market share have occurred. These are of two types - those related to patent expiration and those unrelated to patent expiration. Direct government pressure to lower prices, as in the case of Roche and Librium, has rarely occurred.

(1) Only One Product Has Achieved A Significant Market Share With A Price Reduction Strategy At The Time of Patent Expiration

When the patent on oxytetracycline expired in 1966 and I.C.I. introduced a branded equivalent product, a full scale price war started in the market for broad spectrum antibiotics. I.C.I. set its price 56% below the price of Terramycin, Pfizer's oxytetracycline product, and was successful in obtaining a reasonable market share through a combination of its price reduction strategy and the goodwill attached to the name of the company. Although the synthetic antibiotics were growing fast at this time, I.C.I.'s product obtained market share at the expense of both Pfizer and Lederle's products. Because its product was identical, Pfizer also reduced its price, as can be seen in Table 5.2, but to little effect. I.C.I.'s success in achieving a substantial market share with a price reduction strategy relied on an unusual combination of market characteristics, which, so far, have not

TABLE 5.2

SELECTED PRICES IN BROAD
SPECTRUM ANTIBIOTIC MARKET
1966-1973 FOR 100-250mg
TABLETS
(Year end prices)

PRODUCT/COMPANY	DATE OF INTRODUCTION	1966	1967	1968	1969	1970	1971	1972
Achromycin/Lederle	Pre-1955	£3.26	3.26	1.55	1.53	1.53	1.52	1.52
Ledermycin*/Lederle	Pre-1955	6.83	6.83	6.83	6.83	6.83	6.82	8.18
Terramycin/Pfizer	Pre-1955	4.19	4.19	3.78	3.78	3.78	3.21	3.21
Imperacin/I.C.I.	1966	1.85	1.40	1.26	1.26	1.26	1.17	1.17
Penbritin/Beecham	1961	6.25	5.48	3.95	3.45	3.45	3.10	3.10
Mysteclin/Squibb	1957	4.25	4.25	4.25	3.19	3.19	3.19	3.19

* Only sold in 300mg. tablets.

Source: Monthly Index of Medical Statistics.

In the 1964-66 period, antibiotic manufacturers were coming under strong pricing pressures at the government level.

There was a relatively high average prescription price and yet tetracyclines were the most commonly prescribed of all drugs.

The market was characterised by extensive generic prescribing. In 1968, for example, 31% of all prescriptions for broad spectrum antibiotics, were generically written - thus permitting easier entry for a new product.

No such significant product has had its patent expire.

I.C.I.'s entry success (as measured in terms of market share) has not been encountered in other therapeutic classes. Berk Pharmaceuticals has introduced a large number of new products into well established markets - often generically equivalent to existing products - but has failed to achieve significant market share with them. For example:

TABLE 5.3

<u>The Therapeutic Class</u>	<u>Year of Intro.</u>	<u>Generic Equivalent</u>	<u>Berk's Price as % of Existing Products</u>
Broad-spectrum antibiotics	1966	Oxytetracycline	38%*
Urinary anti-bacterials	1965	Nitrofurantoin	86%

* As % of price of the price of Terramycin.

(2) Price Reduction Strategies Before Patent Expiration (Or Of Non-Patented Products) Appear To Have Been Most Effectively Used To Increase Total Market Size Rather Than Market Share

Price reduction strategies have been used by companies to enlarge the market for their products. This is particularly true where the products have significant therapeutic advantages over existing substitute products, but are initially much more expensive. Two examples, both in the broad spectrum antibiotic market, illustrate this point, although the extent to which the cephalosporin products have been successful is questionable:

Beecham reduced the price of ampicillin from £5.48 to £3.10 (for 100-250 mg tablets) between 1967 and 1971.

It was competing with the tetracyclines and yet was a superior product being a semi-synthetic penicillin. In this particular situation Beecham's price reduction strategy was undoubtedly influenced by the price levels in the rest of the antibiotic market.

Both Glaxo and Lilly introduced identical cephalosporin products into the antibiotic market in Nov/Dec 1969.

These products are generally more effective than ampicillin, but cost over four times as much (£13.50 per 100 250 mg tablets). Most doctors are aware of the large price differential, and for this reason do not prescribe it as a drug of first choice. In an attempt to expand the cephalosporin market, both companies reduced their prices by 15% in December 1972.

Only one major company appears to have used a price reduction strategy in an attempt to gain market share. This occurred in 1973 when Boots reduced the price of its already successful systemic anti-inflammatory drug, Brufen from £2.50 (per 100-250 mg. tablets) to £2.00. It appears doubtful whether this had any direct impact on the product's market share, although Boots sales representatives made strong use of the reduction in their detailing themes.

The effect of the government-enforced price reduction of 60% on Librium and 75% on Valium was to lower Roche's market share by an equivalent amount⁽¹⁾, thereby having little or no effect on the company's unit sales. A similar result occurred earlier, in 1962, when the government invalidated a patent belonging to Smith Kline & French, causing the company to implement an immediate price reduction of 86%.

(1) See also Chorodiazepoxide and Diazepam, Report of the Monopolies Commission, April 1973. This was the report that led to the price reduction mentioned.

6. UNIQUE PRODUCT CHARACTERISTICS AND A VARIETY OF
LARGELY UNEXPLAINABLE FACTORS INFLUENCE MARKET
SHARE

Besides promotion expenditure, product quality is the main factor determining whether or not a manufacturer obtains doctor acceptance for its products. Discussion of this factor is beyond the scope of this report, but would seem to be related to the quality of the research and development efforts as well as a fair amount of what can only be called "luck". Besides product quality, per se, certain product characteristics undoubtedly affect market share as do a number of other factors that cannot easily be explained.

(1) Product Characteristics And Manufacturers Claims
For Their Products Affect Market Share

The nature of markets per se was discussed briefly at the beginning of Chapter 4, where it was mentioned that many products even though competing in the same therapeutic class are not direct substitutes with all the other products. This usually arises due to the characteristics unique to many of the individual products which affect the volume of prescriptions written. Two examples should help clarify this:

In the market for psychostimulants, one company's major product tends to be prescribed primarily for mild anxiety and mild depression with the result that patients rarely receive more than two prescriptions per course of treatment.

Many of the other products in that therapeutic class

class however are used for more severe cases of depression, and the average number of prescriptions per patient per course of treatment is four instead of two.

Similarly, in the tranquillizer market, 81% of all prescriptions for one company's product are for neurotic conditions and only 2% of prescriptions are for psychoses. On the other hand, 26% of all prescriptions for a second company's product are for psychoses and only 39% for neuroses.

Since psychoses tend to be treated more often than not in hospitals, the second company's product tends to be a hospital as opposed to a general practitioner product.

It is the characteristics of the individual products that cause these differences. Clearly the products are not direct substitutes with those against which they are ostensibly competing for market share. There can be little doubt therefore that such product characteristics can have a great effect on market share. If it was available, measuring a product's success as a percentage of market potential would give more accurate results of product success.

Manufacturers are also able to "position" their products in a particular market by making claims as to the uses of their product. The way a product is positioned can have a major impact on market share.

During the life of a product, manufacturers are constantly making new claims for their product to differentiate it from competitors and/or to widen the potential market for the product.

For example, in March 1973 one company claimed that one of its plain topical steroid products is also highly effective treating scalp conditions. Within four months the product increased its market share from 11.0% to 15.5%.

(2) Identical Products Launched At The Same Time With Identical Promotion Can Vary Widely In Their Success

There are at least three examples in the period under study (1968-1973) in which two branded products have been generically identical, been launched at the same time by reputable companies with about the same levels of promotion expenditure, at identical prices, and yet one has achieved a significant market share and the other has not. All three examples are in the large broad spectrum antibiotic market:

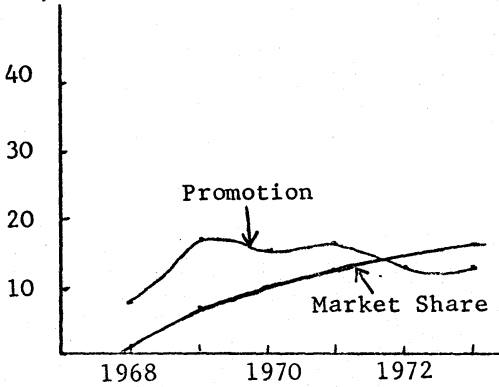
Chart 5.5 compares relevant market share and market promotion expenditures for each product. In terms of the effectiveness of the marketing operations, both companies marketing generic product No.2 achieved an 80% level of doctor awareness in the first year after introduction, thereby indicating that factors other than marketing strategy are important to a product's success.

CHART 5.5

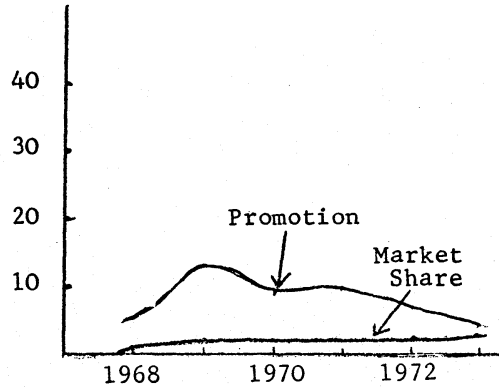
COMPARISON OF MARKET SHARES
AND MARKET PROMOTION
EXPENDITURES FOR GENERICALLY
IDENTICAL PRODUCTS

GENERIC PRODUCT NO. 1

PERCENT MARKET
SHARE/PROMOTION

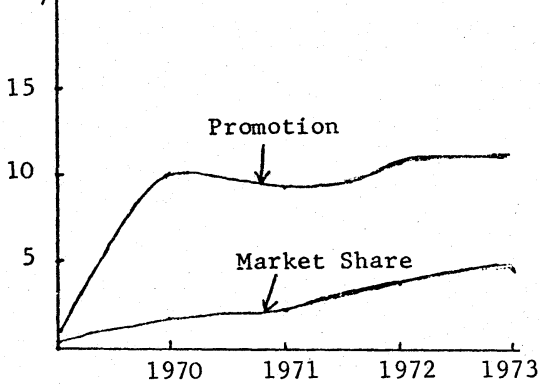


PERCENT MARKET
SHARE/PROMOTION

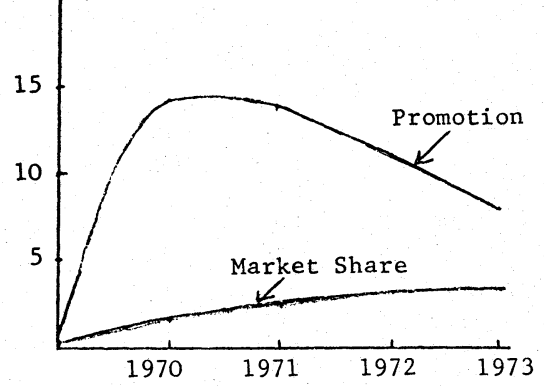


GENERIC PRODUCT NO. 2

PERCENT MARKET
SHARE/PROMOTION

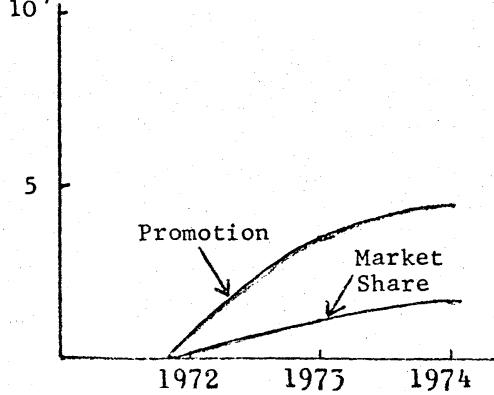


PERCENT MARKET
SHARE/PROMOTION

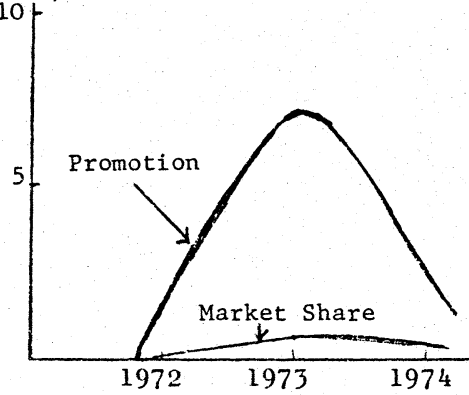


GENERIC PRODUCT NO. 3

PERCENT MARKET
SHARE/PROMOTION



PERCENT MARKET
SHARE/PROMOTION



CHAPTER 6 : COMPETITION IN THE
'OVER-THE-COUNTER' (OTC) MARKET

In Chapter 3 it was stated that the nature of the market for Over-The-Counter drugs is considerably different from that of ethical pharmaceuticals.

The only historical data available on this market was market share for the five years from 1969 to 1973, for sales through retail chemists. Promotional data was not available nor was data concerning the increasing percentage of OTC sales made through non-chemist outlets such as grocery stores, discount stores and department stores. For these reasons, the analysis of competition in this section of the pharmaceutical industry, and how it has changed, is necessarily limited in scope. However basic data on the structure of the market and its major market segments is provided. Particular attention has been given to the ten largest product groups, that together account for 72% of the OTC market. These are listed in Table 6.1.

Also included is a brief qualitative assessment of some of the marketing trends that are already becoming evident in the OTC market.

TABLE 6.1:TEN LARGEST OTC PRODUCT GROUPS⁽¹⁾Infant milk products⁽²⁾

Analgesics

Anti-obesity preps.

Cough remedies

Antacids

Vitamins

Tonics

Oral cold preparations

Dermatological preps.⁽³⁾

General antiseptics

(1) Ranked according to 1973 sales volume

(2) Not strictly part of the OTC market but included as such in IMS reports for historical reasons

(3) Excluding scalp and acne preparations

1. TEN LARGE COMPANIES CONTROL OVER HALF OF THE OTC MARKET AND OF THE TOP 25 PRODUCTS

(1) The 20 Largest Companies Accounted For 77% Of OTC Sales In 1973

The following table shows the concentration of marketing power among the companies in the OTC market in 1973:

TABLE 6.2:

<u>Companies Ranked according to annual sales volume</u>	<u>Percent of total Market</u>	<u>Cumulative percent</u>
Top 5	36.6%	36.6%
6 - 10	20.6	57.2
11 - 15	12.4	69.6
16 - 20	7.9	77.5
21 - 30	7.6	85.1
31 - 40	4.3	89.4
41 - 50	3.0	92.4
51 - 100	6.5	98.9
All other	1.1	100.0%

Table 6.3 lists the twenty leading manufacturers of OTC products in 1973 together with the number of products they market, and their share of the total OTC market.

(2) The Ten Largest Companies Have 19 Of The Top 25 Products

The leading products - like the individual companies - account for a significant percentage of the total market. This percentage changed very little between 1969 and 1973:

TABLE 6.4:

<u>Products ranked according to annual sales volume</u>	<u>Cumulative percent of Total Market 1969</u>	<u>Cumulative percent of Total Market 1973</u>
Top 5	23.6%	20.9%
6 - 10	33.7	30.3
11 - 20	45.0	43.0
21 - 30	53.0	51.9
31 - 40	59.4	58.3
41 - 50	65.3	64.0
All other	34.7	36.0
	<u>100.0%</u>	<u>100.0%</u>

TABLE 6.3:

PERCENTAGE OF OTC MARKET
ACCOUNTED FOR BY 20 LARGEST
COMPANIES IN 1973

<u>RANK</u>	<u>MANUFACTURER</u>	<u>NUMBER OF PRODUCTS</u>	<u>% OF INDUSTRY TOTAL</u>	<u>CUMULATIVE PERCENTAGE</u>
1	A	29	9.9%	9.9%
2	B	12	8.6	18.5
3	C	2	6.6	25.1
4	D	16	6.1	31.2
5	E	19	5.4	36.6
6	F	11	5.2	41.8
7	G	14	4.5	46.3
8	H	8	4.1	50.4
9	I	13	3.8	54.2
10	J	16	3.0	57.2
11	K	11	2.7	59.9
12	L	8	2.6	62.5
13	M	10	2.5	65.0
14	N	1	2.3	67.3
15	O	8	2.3	69.6
16	P	18	2.1	71.7
17	Q	6	2.0	73.7
18	R	3	1.5	75.2
19	S	10	1.2	76.4
20	T	6	1.1	77.5

* Indicates company with no significant involvement in ethical pharmaceutical market.

The position of the leading companies appears to be dependent on their having one or more products that are ranked among the 25 leading products in the market:

TABLE 6.4:

<u>Ten Largest Companies</u>	<u>No. of products ranked among top 25 products</u>
A	1
B	1
C	2
D	3
E	3
F	2
G	2
H	2
I	3
J	-
	<hr/>
	19

2. AN OLIGOPOLISTIC STRUCTURE EXISTS WITHIN EACH OTC MARKET SEGMENT

As with the market for ethical pharmaceuticals discussed in Chapter 4, two or three manufacturers dominate each market segment.

(1) The Degree Of Market Concentration By The Leading Companies Did Not Change Significantly Between 1969 And 1973

Table 6.5 compares the degree of concentration in the ten largest OTC market segments for 1969 and 1973. Four years is not a very long time over which to measure changes in market concentration and therefore it is not surprising that no major shifts in concentration appear to have occurred. In three of the four markets where noticeable change has occurred, there has been a decrease in the levels of concentration. In only one market, oral cold preparations, has an increase occurred. This has been largely due to the market penetration of one product.

(2) The Number Of Brands And Manufacturers Increased Slightly Between 1969 And 1973

In the ten largest market segments there was an increase of 14% in the number of companies and 20% in the number of brands between 1969 and 1973. One product group - dermatological preparations - accounted for a substantial portion of these increases. Only in one product group did the number of competitors decline.

TABLE 6.5:

DEGREE OF CONCENTRATION IN
TEN LARGEST OTC MARKET
SEGMENTS
1969 AND 1973

<u>RANK</u>	<u>MARKET SEGMENT</u>	<u>MARKET LEADER</u>		<u>TOP TWO CO.</u>		<u>TOP FOUR CO.</u>	
		<u>1969</u>	<u>1973</u>	<u>1969</u>	<u>1973</u>	<u>1969</u>	<u>1973</u>
1	Infant Milk Foods	46%	48%	85%	86%	100%	100%
2	Analgesics	28	25	50	42	80	69
3	Anti-obesity preparations	52	53	73	74	92	93
4	Cough remedies	12	12	22	23	38	40
5	Antacids	30	27	49	45	75	79
6	Vitamins	36	35	67	63	84	82
7	Tonics	28	29	51	53	70	68
8	Oral cold preparations	23	32	46	57	72	83
9	Dermatological preps.	37	22	58	39	76	62
10	General antiseptics	34	27	59	50	91	79

* Only three competitors

TABLE 6.6:

COMPARISON OF NUMBER OF
COMPANIES AND PRODUCTS
COMPETING IN TOP 10 MARKET
SEGMENTS IN 1969 AND 1973

<u>MARKET SEGMENT</u>	<u>NO. OF COMPANIES</u>			<u>NO. OF BRANDS</u>		
	<u>1969</u>	<u>1973</u>	<u>DIFF.</u> <u>1969/73</u>	<u>1969</u>	<u>1973</u>	<u>DIFF.</u> <u>1969/73</u>
Infant Milk Products	4	3	-1*	4	5	+1
Analgesics	10	12	+2	13	16	+3
Anti-obesity preps.	6	8	+2	8	10	+2
Cough remedies	21	23	+2	22	25	+3
Antacids	11	11	-	14	14	-
Vitamins	6	7	+1	9	11	+2
Antibiotics	14	14	-	16	17	+1
Oral cold preps.	6	7	+1	7	10	+3
Dermatological preps.	9	14	+5	11	17	+6
General antiseptics	7	8	+1	7	8	+1
TOTAL	<u>94</u>	<u>107</u>	<u>+13</u>	<u>111</u>	<u>133</u>	<u>+22</u>

One competitor acquired by another already competing in this product group.

the smallest competitor was purchased by the market leader.

The net gain in the number of products equals the number of new product introductions since no products were withdrawn from the market (among these market segments) during the period under study. Table 6.6 shows the comparison between 1969 and 1973 for both the number of companies and number of brands.

(3) There Appear To Be More Companies And Brands Competing In Those Market Segments Where The Degree Of Concentration Is Lowest

It is noticeable that in those market segments where the percentage of the market held by the top four companies in 1973 is below 70%, more companies and brands exist than in the other markets:

TABLE 6.7:

Degree of Concentration in Market Segments	Market Segment*	No. of Companies	No. of Brands
Over 70%	Infant milk foods	3	5
	Anti-obesity preps.	8	10
	Oral cold preps.	7	10
	Vitamins	7	11
	Antacids	11	14
	General antiseptics	8	8
Below 70%	Analgesics	12	16
	Tonics	14	17
	Dermatological preps.	14	17
	Cough remedies	23	25

* In order of descending levels of concentration.

3. THE MARKET LEADERS CHANGED IN ONLY FIVE OUT OF THE 30 MARKET SEGMENTS

There appears to be more stability in the OTC market segments than there is in the various therapeutic classes in the ethical pharmaceutical market.

(1) With Very Few Exceptions, The Same Companies And Brands Dominated The Individual Market Segments In 1973 As In 1969

The market leaders (i.e. the companies with the largest cash value market shares) changed in only five of the 30 market segments over the four year period for which data is available. The following table shows these market segments together with the market shares of the leading companies in both 1969 and 1973.

TABLE 6.8:

<u>Market Segment</u>	<u>Market Leader 1969</u>		<u>Market Leader 1973</u>	
	<u>Market Share</u>		<u>Market Share</u>	
	<u>1969</u>	<u>1973</u>	<u>1973</u>	<u>1969</u>
Infant milk foods	46%	38%	39%	48%
Vitamins	36	28	32	35
Oral cold preps.	23	25	14	32
Gen. antiseptics	34	17	24	27
Acne preps.	55	29	19	40

Of the three changes in market leadership, only one was due to a new product introduction in the time period under study. This product was the leading new

Analysis of the top four companies in each market segment also indicated a high degree of market stability. Taking all 29 markets, 84% of the companies comprising the top four in 1969 still comprised the top four in 1973.

The fact that the leading products did not change substantially over time is indicated by the fact that the top 8 products in 1969 and 1973 were the same (although in a slightly changed order); and 18 of the 25 leading products in 1969 were still ranked among the top 25 in 1973.

(2) In Spite Of Relative Stability, There Were Some Significant Shifts In The Market Shares Of Individual Products

Although the OTC market is characterised by a greater degree of stability than the ethical market, measuring the overall changes can fail to show quite large changes in the market positions of both products and companies - particularly when the time period is relatively short. Eighteen products in twelve market segments changed their market shares by ten percentage points or more between 1969 and 1973, but only three out of the 18 products were in the ten largest market segments.

<u>MARKET SEGMENT</u>	<u>CHANGES IN MARKET SHARES</u>	
	<u>1969</u>	<u>1973</u>
Oral cold preps.	14%	32%
Dermatolog.preps.	37	22
Gen.antiseptics	33	17
Nasal cold preps.	37	13
"	4	54
"	19	5
Scalp preps.	-	23
Acne preps.	55	30
"	19	40
Antidiarrhoeals	38	25
Bronchodilators	55	72
"	20	10
Haematinics	83	50
"	-	37
Special foods	83	19
"	1	46
Contraceptives	56	24
Sedatives	33	43

4. ABOUT 50 NEW PRODUCTS WERE INTRODUCED INTO THE OTC MARKET BETWEEN 1968 AND 1973

The exact number of new product introductions is not included in the data available to us, but it indicates that across all market segments about 50 new products were introduced. Of this number, 26 had sales in excess of £10,000 per year in 1973.

(1) Sixteen Products Introduced During the Period Had Sales In Excess of £50,000 Per Year in 1973

The ten largest companies introduced nine of the sixteen most important products in the period from 1969 to 1973. Two of these companies introduced six of these products, as can be seen from the following table:

TABLE 6.10:

	<u>COMPANY</u> <u>ranked according to</u> <u>1973 sales volume</u>	<u>NUMBER OF NEW</u> <u>PRODUCTS ACHIEVING</u> <u>SALES IN EXCESS OF</u> <u>£50,000 IN 1973</u>
1.	A	1
2.	B	1
3.	C	1
4.	D	3
5.	E	-
6.	F	-
7.	G	3
8.	H	-
9.	I	-
10.	J	-
	All other companies	7
		<u>16</u>

(2) Only One New Product Achieved A Market Share In Excess of 15% In The 10 Largest Market Segments

Few of the 16 leading new products achieved substantial market shares by 1973. Most obtained sales in

largest market segments. In fact of the 16 products, 11 were introduced into the ten largest market segments. Only 3 of the 16 products achieved market shares in excess of 15%, and only one of these was introduced into the ten largest market segments.

LE 6.11:

<u>Market Segment</u>	<u>1973 Sales Value</u> (£'000)	<u>1973 Market Share</u>
Oral cold preparations	424	32%
Scalp preparations*	126	23%
Nasal cold preparations*	104	46%

*Not included among ten largest market segments.

A number of new products were unable to maintain their initial sales success. This was true even for those products that managed to obtain a significant market share within the first 2/3 years after introduction:

LE 6.12:

<u>Market Segment</u>	<u>Market Share</u>			
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>
Nasal cold preparations	83%	74%	35%	17%
Haematinics	25%	43%	37%	n/a
Haematinics	12%	11%	4%	2%

With the possible exception of the nasal cold which appears to be a classic example of a product that was subsequently replaced by a superior product the other examples are typical of new product introductions in the OTC market.

Very few new products are successful in obtaining a strong market position very rapidly. This is in marked contrast to the observed patterns in the ethical pharmaceutical industry.

5. MARKET TRENDS INDICATE THAT THE OTC DRUG MARKET WILL BE INCREASINGLY DOMINATED BY THE LARGER COMPANIES WHICH HAVE CONSIDERABLE MARKETING FORCE

Certain long term trends are evident in all areas of the branded OTC drug market. Although most of these trends cannot be quantified, they have major implications for the future degree of competition in this market segment.

(1) Competition Among Manufacturers Of Branded OTC Drugs Is Likely To Intensify

A number of elements in the marketing mix are unlikely to expand considerably in the next ten years.

Included among these will be:

- . The number of retail outlets
- . The number of different items carried by the typical store
- . The number of hours that a consumer will devote to shopping
- . The number of brands that a consumer can recall and in which he/she can believe
- . The number of promotional, advertising, and store-display items that a retail outlet can use in a given week
- . The number of advertising vehicles that can carry the advertisers' messages to the mass market consumer, and the number of hours per week available for a consumer to receive these messages.

Manufacturers will, however, probably request more promotions and greater retail space utilization. This will encourage retailers to:

- . Reduce duplicate items and lines to increase turnover and diminish inventories

Bypass wholesalers and other middlemen

- Cut average margins on all fast-moving items regardless of manufacturers' suggested retail prices
- Promote private label merchandise
- Eliminate slow-moving items
- Insist that manufacturers withdraw slow-moving items when new products are added to the line
- Offer new products only if there is assurance from the manufacturer that adequate promotional efforts will be employed to sell the products through the store
- Seek products usually sold by other types of outlets if these products can generate good sales and/or profit margins

These changes in the marketing environment will place increased competitive pressures on manufacturers, and they will have to respond to these pressures if product profitability is to be maintained. It is likely that shorter product life cycles will become more prevalent because innovations will be quickly copied and improved upon; and that competition for available innovative and marketing talent will be greater. The risks and costs of new product introductions will undoubtedly increase as will the costs of defending existing brand and market positions. This will involve having:

- Advertising pull-through power for branded items
- First class retail store servicing to fatten the profit margins of retailers
- Better promotional offers and in-store support than the competition

(2) Giant Marketers Will Increasingly Dominate The Market Due To Their Marketing, Advertising And Field Selling Skills

The growth pressures on companies will require most leading consumer products manufacturers to find new areas of profit growth, both through acquisitions and new product introductions. This means that a number of large multinational companies not currently competing in the OTC drug market may move into this area in the future; possibly through the acquisition of some of the smaller companies in the market. For example, trade reports and press releases have indicated that Gillette intends to market proprietary medicines in the future.

The giant companies who have both push-through and pull-through marketing power will be at an obvious advantage in marketing their products because they will be able to:

- Meet unique or demanding store service requirements
- Service retailers more effectively than competition
- Advertise to such a degree that other brands cannot support a minimum effective level
- Obtaining advertising buying power so great that networks and other media will offer the most effective advertising vehicles to a specific manufacturer before approaching any other manufacturer
- Utilize advertising and sales forces more effectively than competition
- Using large, multi-channel sales forces to ensure fast sell-ins and minimum out-of-stock conditions in more than one channel of distribution
- Taking major financial risks on new products
- Attract and hold superior marketing management, innovative personnel and advertising talent

These factors will cause the entry barriers, into major areas where other brands are already established, to be so high that only the largest manufacturers will have the critical mass in terms of the resources required to compete effectively.

The trends described in this section will cause the OTC drug market to be increasingly dominated by large companies which have considerable marketing force. Survival in this marketing environment will be increasingly difficult for small companies or small operating units by 1985.

APPENDIX

TABLE A:

PROFITABILITY OF 'ENTERPRISES': 1968

Enterprises	Turnover (£ mill)	Own Capital (£ mill)	Value Added (£ mill)	Net Profit (£ mill)	Net Profit	Net Profit	Net Profit
					Turnover (%)	Own Means (%)	Value Added (%)
1	3.1	1.4	1.1	.6	19	43	55
2	1.3	n/a	.3	..	..	..	..
3	1.0	.3	.3	..	..	..	..
4	.9	.2	.3	..	..	..	..
5*	19.3	9.5	n/a	2.5	13	26	n/a
6	1.5	.2	.5	.3	20	150	60
7	1.2	n/a	.2	..	..	..	..
8							
9	.6	.3	.2	.1	17	33	50
10	11.6	4.1	4.1	2.9	25	71	71
11							
12	3.9	.6	1.4	.8	21	133	57
13							
14	.9	.4	.3	..	..	..	..
15	10.0	6.0	5.4	1.5	15	25	28
16	24.2	13.5	8.2	3.5	14	26	43
17	15.6	6.1	5.6	4.3	28	70	77
18	3.2	.7	.9	.3	9	43	33
19	1.2	.1	.4	.1	8	100	25
20	2.8	1.1	1.2	.5	18	45	42
21	12.5	12.6	3.9	.1	1	1	3
22							
23	3.7	1.2	1.3	.8	22	67	62
24	.5	.1	.3	.1	20	100	33
25	14.1	1.5	2.5	1.1	8	73	44
26	6.3	4.3	.9	.3	5	7	33
27	.6	.2	.2	..	..	..	..
28	4.7	6.6	2.1	1.4	30	21	67
29	6.6	4.0	2.9	1.7	26	43	59
30	4.0	1.1	.9	.2	5	18	45
31	21.8	12.8	6.1	3.4	16	27	56
32							
33	3.3	1.9	1.7	1.1	33	58	65
34							
35	7.3	4.1	1.7	.9	12	22	53
36*	123.2	28.5	n/a	19.0	15	67	n/a
37*	62.5**	33.9***	n/a	7.7***	n/a	23	n/a
38							
39	7.6	1.5	2.7	1.5	20	100	56

* Cannot complete Value Added because data for profits and remuneration refer to world and U.K. activities respectively.

** U.K.

*** World

TABLE A (continued):

PROFITABILITY OF 'ENTERPRISES' : 1969

Enterprise	Turnover (£ mill)	Own Capital (£ mill)	Value Added (£ mill)	Net Profit (£ mill)	Net Profit Turnover (%)	Net Profit		Net Profit Value Added (%)
						Own	Means	
1	3.61	1.61	1.44	.87	24	54	60	
2	1.37	.16	.26	.11	8	69	42	
3	1.09	.34	.37	.08	7	24	22	
4	1.10	.27	.59	.28	25	104	47	
5*	20.36	9.53	n/a	2.57	13	27	n/a	
6	2.11	.19	.54	.28	13	47	52	
7	1.58	.06	.21	.14	3	67	19	
8								
9	.68	.34	.20	.10	15	29	50	
10	10.42	4.17	3.72	2.54	24	61	68	
11								
12	4.20	.77	1.47	.80	19	104	54	
13								
14	.97	.44	.33	.10	10	23	30	
15	11.08	6.52	4.11	1.96	12	21	33	
16	28.12	14.06	8.63	3.53	13	25	41	
17	18.02	6.59	5.52	4.04	22	61	73	
18	3.34	.82	1.06	.40	12	49	38	
19	1.43	.19	.39	.11	8	58	28	
20	3.32	1.30	1.25	.42	13	32	34	
21	12.62	12.53	3.92	.03	..	..	1
22								
23	3.98	1.07	1.24	.66	17	62	53	
24	.74	.13	.30	.17	23	131	57	
25	16.92	1.98	2.38	.84	5	42	35	
26	7.52	4.44	1.81	.68	9	15	38	
27	.70	.22	.19	.06	9	27	32	
28	6.70	6.79	2.40	1.01	15	15	42	
29	6.64	3.92	2.73	1.61	24	41	59	
30	4.30	1.02	.86	.05	1	5	6	
31	23.03	12.18	6.85	3.87	17	32	56	
32								
33	3.49	1.70	1.52	.95	27	56	63	
34								
35	7.97	3.93	2.21	.64	8	16	29	
36*	134.25	42.43	n/a	22.08	16	52	n/a	
37*	75.13**	34.60***	n/a	9.62***	n/a	28	n/a	
38								
39	7.96	2.74	2.41	1.17	15	43	49	

* Cannot complete Value Added because data for profits and remuneration refer to world and U.K. activities respectively.

** U.K.

*** World

BLE A (continued):

PROFITABILITY OF 'ENTERPRISES' : 1970

Enterprise	Turnover (£ mill)	Own Capital (£ mill)	Value Added (£ mill)	Net Profit (£ mill)	Net Profit	Net Profit		Net Profit
					Turnover (%)	Own	Means	Value Added (%)
1	3.99	1.77	1.45	.80	20	45		55
2	1.54	.22	.34	.11	7	50		32
3	1.23	.44	.20	.10	8	23		50
4	1.08	.23	.40	.20	19	87		50
5*	8.13	9.90	n/a	3.03	37	31		n/a
6	2.04	.19	.68	.35	13	184		51
7	1.92	.10	.28	.06	3	60		21
8								
9	.77	.37	.22	.11	14	30		50
10	11.28	4.5	4.04	2.75	24	61		68
11								
12	4.29	.92	1.46	.78	18	85		53
13								
14	1.09	.49	.37	.10	9	20		27
15	12.91	6.76	4.47	.47	4	7		11
16	21.79	14.52	9.3	3.79	12	26		41
17	19.96	7.41	6.01	4.26	21	57		71
18	3.92	1.17	1.35	.62	16	53		46
19	1.47	.22	.36	.07	5	32		19
20	3.20	1.45	1.29	.30	9	21		23
21	12.69	12.46	4.14	.11	1	1		3
22								
23	3.98	1.34	1.15	.50	13	37		43
24	.95	.26	.37	.22	23	85		59
25	19.08	2.56	2.96	.94	5	37		32
26	8.91	4.87	1.36	.04	..	1		3
27	.85	.24	.22	.06	7	25		27
28	16.08	7.29	4.63	1.31	8	18		28
29	7.31	4.09	2.83	1.53	21	37		54
30	5.37	1.15	1.11	.22	4	19		20
31	27.26	13.95	7.99	4.39	16	31		55
32								
33	3.89	1.78	1.44	.82	21	46		57
34								
35	8.63	4.30	2.27	.49	6	11		22
36*	150.75	39.85	n/a	24.33	16	61		n/a
37*	18.52**	37.09***	n/a	8.77***	n/a	24		n/a
38								
39	8.09	2.93	2.25	.86	11	29		38

* Cannot complete Value Added because data for profits and remuneration refer to world and U.K. activities respectively.

** U.K.

*** World

TABLE A (continued):

PROFITABILITY OF 'ENTERPRISES' : 1971

Enterprise	Turnover (£ mill)	Own Capital (£ mill)	Value Added (£ mill)	Net Profit (£ mill)	Net Profit	Net Profit		Net Profit
					Turnover (%)	Own	Means	Value Added (%)
1	4.90	1.99	1.64	.86	18		43	52
2	1.87	.35	.61	.23	12		66	38
3	1.34	.46	.20	.10	7		22	50
4	1.14	.29	.40	.19	17		66	48
5*	8.76	10.30	n/a	2.94	34		29	n/a
6	2.85	.21	.68	.22	8		105	32
7	2.23	.13	.31	.05	2		38	16
8								
9	.92	.41	.26	.13	14		32	50
10	10.6	4.82	3.86	2.22	21		46	58
11								
12	4.41	1.51	1.38	.62	14		41	45
13								
14	1.19	.53	.39	.08	7		15	21
15	12.94	6.42	3.67	-.40	-3		-6	-11
16	34.61	15.12	9.96	3.69	11		24	37
17	22.58	7.98	6.40	4.35	19		55	68
18	4.45	1.4	1.69	.80	18		57	47
19	1.83	.26	.61	.25	14		96	41
20	3.55	1.68	1.27	.38	107		23	30
21	14.61	12.49	4.79	.32	2		3	7
22								
23	5.54	1.58	1.73	.88	16		56	51
24	1.13	.38	.40	.22	19		58	55
25	23.26	3.02	2.61	-.16	..		-5	-6
26	9.41	4.83	2.11	.62	7		13	29
27	.88	.27	.25	.04	5		15	16
28	18.83	7.68	4.36	1.06	6		14	24
29	7.37	4.10	2.67	1.27	17		31	48
30	6.14	1.41	1.50	.44	7		31	29
31	30.71	16.32	9.10	5.10	17		31	56
32								
33	3.88	1.97	1.32	.65	17		33	49
34								
35	10.38	4.29	2.60	.59	6		14	23
36*	165.65	38.39	n/a	23.79	14		62	n/a
37*	21.71**	36.99***	n/a	9.06***	n/a		25	n/a
38								
39	8.50	3.14	2.17	.70	8		22	32

* Cannot complete Value Added because data for profits and remuneration refer to world and U.K. activities respectively.

** U.K.

*** World

TABLE A (continued):

PROFITABILITY OF 'ENTERPRISES' : 1972

Enterprise	Turnover (£ mill)	Own	Value	Net	Net Profit	Net Profit	Net Profit
		Capital (£ mill)	Added (£ mill)	Profit (£ mill)	Turnover (%)	Own Means (%)	Value Added (%)
1	5.20	2.42	1.73	.82	16	34	47
2	1.70	.49	.59	.25	15	51	42
3	1.43	.48	.20	.19	6	19	45
4	1.37	.33	.45	.20	15	61	44
5*	9.55	10.86	n/a	2.87	30	26	n/a
6	3.20	.28	.78	.24	8	86	31
7	2.88	.18	.41	.09	3	50	22
8							
9	.90	.45	.28	.15	17	33	54
10	11.64	5.20	4.32	2.60	22	50	60
11							
12	4.85	2.07	1.67	.93	19	45	50
13							
14	1.21	.56	.38	.03	2	5	8
15	20.30	7.74	6.78	2.26	11	29	33
16	37.58	16.16	10.16	2.89	8	18	28
17	25.83	9.82	7.84	5.44	21	55	69
18	4.85	1.75	1.93	.93	21	53	48
19	1.94	.35	.71	.25	13	71	35
20	3.68	1.84	1.43	.55	15	30	38
21	13.94	13.01	4.67	.93	7	7	20
22							
23	6.52	2.11	1.91	.97	15	46	51
24	1.23	.35	.49	.28	23	80	57
25	24.04	.24	.64	-2.59	-11	-1079	-405
26	10.94	5.40	2.8	1.22	11	23	44
27	.94	.29	.25	.05	5	17	20
28	20.06	7.94	4.86	1.01	5	13	21
29	8.83	3.94	2.98	1.20	14	30	40
30	7.44	1.72	1.77	.49	7	28	28
31	32.38	17.54	9.20	4.71	15	27	51
32							
33	4.75	2.80	1.60	.81	17	39	51
34							
35	10.88	4.60	3.29	1.42	13	31	43
36*	181.97	53.16	n/a	26.91	15	51	n/a
37*	25.56**	43.72***	n/a	11.71***	n/a	27	n/a
38							
39	9.77	3.55	2.26	.66	7	19	29

* Cannot complete Value Added because data for profits and remuneration refer to world and U.K. activities respectively.

** U.K.

*** World

TABLE B:SUMMARY STATISTICS

		<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
(£ mill)	Turnover	379.7	423.9	482.2	535.8	597.8
('000)	Employment	48.5	50.9	54.1	55.5	54.0
(£ mill)	Wages & Salaries	53.7	58.9	68.9	78.1	85.9
(£ mill)	Net Profits	56.7	60.9	62.3	61.6	72.7
(£ mill)	Cash Flow	67.7	72.6	75.0	77.9	77.7
(£ mill)	Own Capital	158.5	176.9	184.5	190.3	220.3
(£ mill)	Exports	77.8	94.6	116.9	131.5	144.9
(£ mill)	Value Added*	110.4	119.8	131.2	139.7	158.6
(%)	Net Profit/Turnover	14.9	14.4	12.9	11.5	12.2
(%)	Net Profit/Own Capital	35.8	34.4	33.8	32.4	33.0
(%)	Net Profit/Value Added	51.4	50.8	47.5	44.1	45.8
(£/man)	Value Added/Employee	2,276	2,345	2,425	2,517	2,937
(£/man)	Wages Salaries/Employee	1,107	1,157	1,274	1,407	1,591

* Value Added estimated as Net Profits plus Wages & Salaries.

TABLE A:

CONCENTRATION MEASURES

<u>4-firm Concentration</u>	1968	1969	1970	1971	1972
Turnover	61.0	61.4	61.3	61.1	61.0
Employment	62.9	60.7	58.7	59.1	58.8
Wages & Salaries	59.8	57.2	53.7	55.3	55.1
Net Profits	61.0	65.1	67.1	68.6	67.1
Cash Flow	60.9	64.4	65.8	66.9	61.9
Own Capital	55.9	58.6	57.1	56.1	59.3
Exports	55.2	54.4	54.6	56.4	56.1
<u>8-firm Concentration</u>					
Turnover	77.2	77.5	77.0	77.4	76.8
Employment	77.8	76.0	75.6	74.8	74.1
Wages & Salaries	75.7	73.2	73.6	73.4	73.0
Net Profits	79.4	81.9	84.9	85.1	81.7
Cash Flow	78.7	80.9	83.0	82.7	79.1
Own Capital	77.9	78.4	77.2	76.3	78.2
Exports	75.3	73.2	71.5	74.5	74.1
<u>Linda Index : Core: L_{n^*m}/n^*m</u>					
Turnover	.32/22	.32/22	.33/22	.33/22	.32/21
Employment	.31/23	.30/23	.29/24	.29/22	.28/24
Wages & Salaries	.28/22	.26/22	.26/22	.26/22	.26/22
Net Profits	.33/18	.38/18	.47/18	.47/19	.37/21
Cash Flow	.33/19	.38/21	.42/19	.40/22	.32/19
Own Capital	.27/13	.31/13	.29/13	.28/15	.32/21
Exports	.28/17	.27/21	.29/21	.30/20	.29/13
<u>Linda Index : Super Powers: $Ln^*_h </n^*_h <$</u>					
Turnover	1.11/3	1.06/3	1.05/3	1.05/3	1.06/3
Employment	1.41/2	1.39/2	1.34/2	1.26/2	1.26/2
Wages & Salaries	1.34/2	1.31/2	1.24/2	1.25/2	1.17/2
Net Profits	1.24/2	1.19/3	1.39/2	1.31/2	1.15/2
Cash Flow	1.12/2	1.22/3	1.30/2	1.12/2	.91/3
Own Capital	.65/3	.75/3	.70/3	.62/3	.75/3
Exports	1.63/2	1.49/2	1.35/2	1.42/2	1.11/2
<u>Coefficient of Variation</u>					
Turnover	1.87	1.90	1.88	1.88	1.87
Employment	1.94	1.91	1.83	1.83	1.84
Wages & Salaries	1.79	1.72	1.64	1.67	1.70
Net Profits	1.90	2.06	2.23	2.13	2.10
Cash Flow	1.89	2.08	2.17	2.15	1.78
Own Capital	1.51	1.67	1.59	1.52	1.67
Exports	1.65	1.67	1.66	1.78	1.67

CONCENTRATION MEASURES cont.

<u>Gini Coefficient</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>
Turnover	.67	.67	.67	.67	.67
Employment	.66	.65	.65	.65	.65
Wages & Salaries	.64	.63	.62	.63	.63
Net Profits	.70	.71	.74	.73	.71
Cash Flow	.69	.71	.73	.72	.68
Own Capital	.67	.69	.67	.66	.68
Exports	.64	.64	.63	.66	.65
 <u>Herfindel-Hirschmann</u>					
Turnover	150	149	147	146	145
Employment	158	149	140	140	137
Wages & Salaries	140	128	119	122	122
Net Profits	153	175	193	192	181
Cash Flow	153	172	185	182	139
Own Capital	110	122	114	107	123
Exports	124	122	125	134	123
 <u>Entropy</u>					
Turnover	-108	-109	-109	-109	-109
Employment	-108	-111	-112	-112	-113
Wages & Salaries	-112	-115	-116	-116	-116
Net Profits	-106	-102	-98	-98	-102
Cash Flow	-107	-103	-101	-101	-108
Own Capital	-112	-110	-112	-115	-111
Exports	-113	-115	-114	-112	-113

CONCENTRATION INDUSTRIELLE

* TABLEAU NO 1 *
* * * * *
* 1968 - 1972 *
* * * * *

EVOLUTION DES DONNEES GLOBALES : TOTAL DU SECTEUR ET ECHANTILLON

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
SECTEUR : PHARMACEUTIQUE
ENTREPRISES :

* VARIABLE : 01 CHIFFRE D'AFFAIRES (000 £) *

		TOTAL				ECHANTILLON			
		I				I			
ANNEE	N	VALEUR (T)	* 1968=100	I	N*	VALEUR (E)	* 1968=100	I	E/T %
*	*	*	*	I	*	*	*	I	*
1968	30	379.737	100	I 29	*	379.055	100	I 99.83	*
1969	31	423.885	111	I 30	*	423.210	111	I 99.84	*
1970	31	482.248	126	I 30	*	481.483	127	I 99.84	*
1971	31	535.779	141	I 30	*	534.897	141	I 99.84	*
1972	31	597.840	157	I 30	*	596.938	157	I 99.85	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*

* VARIABLE : 02 EFFECTIF *

1968	30	48.531	100	I 29	*	48.431	100	I 99.79	*
1969	31	50.903	104	I 30	*	50.796	104	I 99.79	*
1970	31	54.101	111	I 30	*	53.991	111	I 99.80	*
1971	31	55.548	114	I 30	*	55.432	114	I 99.79	*
1972	32	53.974	111	I 31	*	53.867	111	I 99.80	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*
*	*	*	*	I	*	*	*	I	*

CONCENTRATION INDUSTRIELLE

* TABLEAU NO 1 *
* * * * *
* 1968 - 1972 *
* * * * *

EVOLUTION DES DONNEES GLOBALES : TOTAL DU SECTEUR ET ECHANTILLON

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
SECTEUR : PHARMACEUTIQUE
ENTREPRISES :

* VARIABLE : 03 MASSE SALARIALE (000 £) *

* ANNEE	* N	* VALEUR (T)	* 1968=100	I	N*	* VALEUR (E)	* 1968=100	I	E/T %
*	*	*	*	I	*	*	*	I	*
* 1968	* 30	* 53.656	* 100	I 29	*	* 53.537	* 100	I 99.78	*
* 1969	* 31	* 58.863	* 109	I 30	*	* 58.758	* 109	I 99.82	*
* 1970	* 31	* 68.918	* 128	I 30	*	* 68.811	* 128	I 99.84	*
* 1971	* 31	* 78.086	* 145	I 30	*	* 77.960	* 145	I 99.84	*
* 1972	* 32	* 85.868	* 160	I 31	*	* 85.734	* 160	I 99.84	*
* *	* *	* *	*	I *	*	* *	*	I *	*
* *	* *	* *	*	I *	*	* *	*	I *	*
* *	* *	* *	*	I *	*	* *	*	I *	*
* *	* *	* *	*	I *	*	* *	*	I *	*

* VARIABLE : 04 BENEFICE NET (000 £) *

* ANNEE	* N	* VALEUR (T)	* 1968=100	I	N*	* VALEUR (E)	* 1968=100	I	E/T %
*	*	*	*	I	*	*	*	I	*
* 1968	* 30	* 56.730	* 100	I 29	*	* 56.722	* 100	I 99.99	*
* 1969	* 30	* 60.874	* 107	I 29	*	* 60.838	* 107	I 99.94	*
* 1970	* 31	* 62.255	* 109	I 30	*	* 62.211	* 109	I 99.93	*
* 1971	* 29	* 61.629	* 108	I 28	*	* 61.586	* 108	I 99.93	*
* 1972	* 30	* 72.665	* 128	I 29	*	* 72.631	* 128	I 99.95	*
* *	* *	* *	*	I *	*	* *	*	I *	*
* *	* *	* *	*	I *	*	* *	*	I *	*
* *	* *	* *	*	I *	*	* *	*	I *	*
* *	* *	* *	*	I *	*	* *	*	I *	*

CONCENTRATION INDUSTRIELLE

* TABLEAU NO 1 *
* * * * *
* 1968 - 1972 *
* * * * *

EVOLUTION DES DONNEES GLOBALES : TOTAL DU SECTEUR ET ECHANTILLON

AYS : UNITED-KINGDOM
NSTITUT : LONDON BUSINESS SCHOOL (PROF.J.B.HEATH)
ECTEUR : PHARMACEUTIQUE
NTPREPRISES

* VARIABLE : 05 CASH FLOW (000 £) *										

* * TOTAL I ECHANTILLON I *										

* ANNEE	* N	* VALEUR (T)	* 1968=100	I	N*	* VALEUR (E)	* 1968=100	I	E/T %	*
*	*	*	*	I	*	*	*	I	*	*

* 1968	* 30	* 67.661	* 100	I 29	*	67.650	* 100	I	99.98	*
* 1969	* 31	* 72.601	* 107	I 30	*	72.561	* 107	I	99.94	*
* 1970	* 31	* 75.029	* 110	I 30	*	75.022	* 110	I	99.99	*
* 1971	* 31	* 77.850	* 115	I 30	*	77.845	* 115	I	99.99	*
* 1972	* 30	* 79.878	* 118	I 29	*	79.872	* 118	I	99.99	*
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *

* VARIABLE : 07 CAPITAUX PROPRES (000 £) *										

* 1968	* 30	* 158.544	* 100	I 29	*	158.516	* 100	I	99.98	*
* 1969	* 31	* 176.894	* 111	I 30	*	176.830	* 111	I	99.96	*
* 1970	* 31	* 184.534	* 116	I 30	*	184.436	* 116	I	99.95	*
* 1971	* 31	* 190.335	* 120	I 30	*	190.207	* 119	I	99.93	*
* 1972	* 31	* 220.282	* 138	I 30	*	220.102	* 138	I	99.92	*
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *
* * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *	* * * * *	I * * * *	* * * * *	* * * * *

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CONCENTRATION INDUSTRIELLE

* TABLEAU NO 1 *
* *
* 1968 - 1972 *
* *

EVOLUTION DES DONNEES GLOBALES : TOTAL DU SECTEUR ET ECHANTILLON

AYS : UNITED-KINGDOM
STITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
ECTEUR : PHARMACEUTIQUE
TREPRISES

PAGE 4

* VARIABLE : 08 EXPURT. (000 £) *

TOTAL		ECHANTILLON	
ANNEE	N	VALEUR (T)	VALEUR (E)
*	*	* 1968=100	* 1968=100
*	*	I	I
		E/T %	
*	*	*	*
* 1968	* 30	* 77.817	* 77.806
* 1969	* 31	* 94.555	* 94.538
* 1970	* 30	* 114.649	* 114.625
* 1971	* 31	* 131.463	* 131.449
* 1972	* 31	* 144.851	* 144.833
* *	* *	* *	* *
* *	* *	* *	* *
* *	* *	* *	* *
* *	* *	* *	* *
* *	* *	* *	* *
* *	* *	* *	* *

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TOTAL DU SECTEUR

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF.J.B.HEATH)
SECTEUR : PHARMACEUTIQUE
ENTREPRISES

VARIABLES : 01 CHIFFRE D'AFFAIRES 02 EFFECTIF 03 MASSE SALARIALE
04 BENEFICE NET 05 CASH FLOW 06 INVESTIS BRUTS
07 CAPITAUX PROPRES 08 EXPORT. 09 IMPORT. 10

* A N N E E *													
* VARIABLE* *													
* ***** *													
* I I I *													
* 1968 1969 *													
* ***** *													
* N * M * V * G * H * E * I * N * M * V * G * H * E *													
* ***** *													
01	30*	12.658*	1.87237*	.66670*	150.19190*	-108.40895	I	31*	13.674*	1.90297*	.67466*	149.07374*	-108.68390*
	*	*	*	*	*	*	I	*	*	*	*	*	*
02	30*	1.618*	1.93650*	.65815*	158.33447*	-108.18320	I	31*	1.642*	1.90538*	.65386*	149.37050*	-110.60933*
	*	*	*	*	*	*	I	*	*	*	*	*	*
03	30*	1.789*	1.78998*	.63728*	140.13372*	-111.89654	I	31*	1.899*	1.72496*	.62879*	128.24146*	-114.88905*
	*	*	*	*	*	*	I	*	*	*	*	*	*
04	30*	1.891*	1.89811*	.69522*	153.42730*	-105.70764	I	30*	2.029*	2.06162*	.71285*	175.00941*	-101.92415*
	*	*	*	*	*	*	I	*	*	*	*	*	*
05	30*	2.255*	1.89205*	.68691*	152.66115*	-106.50746	I	31*	2.342*	2.07989*	.71145*	171.80490*	-103.22270*
	*	*	*	*	*	*	I	*	*	*	*	*	*
07	30*	5.285*	1.51211*	.66715*	109.54903*	-112.13601	I	31*	5.706*	1.66692*	.68682*	121.89132*	-110.27946*
	*	*	*	*	*	*	I	*	*	*	*	*	*
08	30*	2.594*	1.65317*	.64167*	124.43265*	-113.27149	I	31*	3.050*	1.66811*	.64063*	122.01887*	-114.54598*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
* ***** *													
* I I I *													
* 1970 1971 *													
* ***** *													
01	31*	15.556*	1.88440*	.67304*	146.80474*	-109.05995	I	31*	17.283*	1.87533*	.67293*	145.70541*	-109.18470*
	*	*	*	*	*	*	I	*	*	*	*	*	*
02	31*	1.745*	1.82719*	.65043*	139.95501*	-112.01567	I	31*	1.792*	1.82876*	.64507*	140.14017*	-112.33046*
	*	*	*	*	*	*	I	*	*	*	*	*	*
03	31*	2.223*	1.63564*	.62493*	118.55871*	-116.34260	I	31*	2.519*	1.66837*	.62568*	122.04690*	-115.86641*
	*	*	*	*	*	*	I	*	*	*	*	*	*
04	31*	2.008*	2.22924*	.74397*	192.56445*	-98.33917	I	29*	2.125*	2.13495*	.72868*	191.65605*	-97.98363*
	*	*	*	*	*	*	I	*	*	*	*	*	*
05	31*	2.420*	2.17493*	.72746*	184.84970*	-100.64491	I	31*	2.511*	2.15110*	.71953*	181.52371*	-101.23122*
	*	*	*	*	*	*	I	*	*	*	*	*	*
07	31*	5.953*	1.59255*	.67188*	114.07124*	-112.42844	I	31*	6.140*	1.52450*	.65663*	107.22855*	-114.56083*
	*	*	*	*	*	*	I	*	*	*	*	*	*
08	30*	3.822*	1.66102*	.63211*	125.29928*	-113.91510	I	31*	4.241*	1.77594*	.65684*	133.99515*	-112.08086*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
* ***** *													

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EVOLUTION DE LA CONCENTRATION

TABLEAU NO 2

TOTAL DU SECTEUR

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF.J.B.HEATH)
SECTEUR : PHARMACEUTIQUE

ENTREPRISES
VARIABLES : 01 CHIFFRE D'AFFAIRES 02 EFFECTIF 03 MASSE SALARIALE
04 BENEFICE NET 05 CASH FLOW 06 INVESTIS BRUTS
07 CAPITAUX PROPRES 08 EXPORT. 09 IMPORT. 10

* * * * * A N N E E * * * * *

VARIABLE

* * * * * I * * * * *

* * * * * I * * * * *

* * * * * I * * * * *

	N	M	V	G	H	E	I	N	M	V	G	H	E
01	31*	19.285*	1.87230*	.67188*	145.33846*	-109.16907I	I	*	*	*	*	*	*
02	32*	1.687*	1.83796*	.64915*	136.81507*	-113.33127I	I	*	*	*	*	*	*
03	32*	2.683*	1.70396*	.63113*	121.98342*	-116.42128I	I	*	*	*	*	*	*
04	30*	2.422*	2.10200*	.70892*	180.61411*	-101.59819I	I	*	*	*	*	*	*
05	30*	2.663*	1.77751*	.67598*	138.65178*	-108.47686I	I	*	*	*	*	*	*
07	31*	7.106*	1.67333*	.68098*	122.58202*	-110.77820I	I	*	*	*	*	*	*
08	31*	4.673*	1.67314*	.65405*	122.56074*	-113.40200I	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*
	*	*	*	*	*	*	I	*	*	*	*	*	*

EVOLUTION DE LA CONCENTRATION

INDICES LINDA (L) ET RATIOS DE CONCENTRATION (CR)

* TABLEAU NO 3 *
* *
* 1968 - 1972 *
* *

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: UNITED-KINGDOM
ITUT : LONDON BUSINESS SCHOOL (PROF.J.B.HEATH)
EUR : PHARMACEUTIQUE
EPRISES

VARIABLE : O2 EFFECTIF

* INDICES L ET CR RELATIFS A N* = * I * COURBES L
* I *****
* I ECHANTILLON * IER MA IMUM : 2EM MAXIMUM: MINIMUM
* I-----*-----:-----:-----

% * : : : : : : : * N I : L *N* : L :N* : L :N* : L
* 4 : 8 : 10 : 12 : 20 : 30 : 40 * I N* : N* * H< : N*H< : H : N*H : M : N*M

* .83129: .57901: .52050: .46494: .33575: .00000: .00000* 30I29 : .33834* 2 : 1.40583: 2 : 1.40583:23 : .31255

R *62.93 :77.78 :81.79 :85.26 :94.86 : .00 : .00 * I :99.79 * : : : : :

* .85009: .52317: .47562: .41406: .30519: .34692: .00000* 31I30 : .34692* 2 : 1.38758: 2 : 1.38758:23 : .29511
R *60.71 :76.03 :80.42 :84.44 :94.90 :99.79 : .00 * I :99.79 * : : : : :

* .82775: .47759: .42080: .38165: .30208: .35284: .00000* 31I30 : .35284* 2 : 1.34418: 2 : 1.34418:24 : .29180
R *58.67 :75.60 :80.83 :84.90 :95.05 :99.80 : .00 * I :99.80 * : : : : :

* .83647: .50337: .41805: .38424: .30294: .32911: .00000* 31I30 : .32911* 2 : 1.25913: 2 : 1.25913:22 : .29141
R *59.12 :74.83 :80.37 :84.43 :94.62 :99.79 : .00 * I :99.79 * : : : : :

* .81253: .50440: .41911: .37784: .29201: .33038: .00000* 32I31 : .33427* 2 : 1.25870: 2 : 1.25870:24 : .28441
R *58.75 :74.07 :79.61 :83.80 :94.52 :99.55 : .00 * I :99.80 * : : : : :

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EVOLUTION DE LA CONCENTRATION

* TABLEAU NO 3 *
* *
* 1968 - 1972 *
* *

INDICES LINDA (L) ET RATIOS DE CONCENTRATION (CR)

: UNITED-KINGDOM
TUT : LONDON BUSINESS SCHOOL (PROF.J.B.HEATH)
EUR : PHARMACEUTIQUE
EPRISES

VARIABLE : 03 MASSE SALARIALE

*****										C O U R B E S L										
INDICES L ET CR RELATIFS A N* =										I ECHANTILLON*IER MA IMUM : 2EM MAXIMUM: MINIMUM										
*****										I-----*-----:-----:-----										
* 4	: 8	: 10	: 12	: 20	: 30	: 40	* N	I	: L	*N* : L	:N* : L	:N* : L	:N* : L	:N* : L	:N* : L	:N* : L	:N* : L	:N* : L	:N* : L	
*****										I N* : N* * HC: N*HC : H: N*H : M: N*M										
* .73065	: .50777	: .45085	: .38827	: .29981	: .00000	: .00000	* 30	I 29	: .31656	* 2	: 1.34484	: 2	: 1.34484	: 22	: .27988					
* 59.82	: 75.68	: 80.29	: 84.60	: 94.79	: .00	: .00	* I	: 99.78	* :	:	:	:	:	:	:	:	:	:	:	:
*****										I*****:*****:*****:*****:*****										
* .71662	: .48003	: .41170	: .35974	: .27202	: .31700	: .00000	* 31	I 30	: .31700	* 2	: 1.31200	: 2	: 1.31200	: 22	: .25900					
* 57.17	: 73.23	: 78.37	: 82.84	: 94.72	: 99.82	: .00	* I	: 99.82	* :	:	:	:	:	:	:	:	:	:	:	:
*****										I*****:*****:*****:*****:*****										
* .74990	: .38090	: .35288	: .32294	: .26812	: .32606	: .00000	* 31	I 30	: .32606	* 2	: 1.24473	: 2	: 1.24473	: 22	: .25714					
* 53.74	: 73.55	: 79.06	: 83.64	: 95.05	: 99.84	: .00	* I	: 99.84	* :	:	:	:	:	:	:	:	:	:	:	:
*****										I*****:*****:*****:*****:*****										
* .76550	: .41789	: .37539	: .33513	: .27107	: .31244	: .00000	* 31	I 30	: .31244	* 2	: 1.14508	: 2	: 1.14508	: 22	: .26157					
* 55.26	: 73.38	: 78.75	: 83.40	: 94.71	: 99.84	: .00	* I	: 99.84	* :	:	:	:	:	:	:	:	:	:	:	:
*****										I*****:*****:*****:*****:*****										
* .79102	: .41804	: .36915	: .34085	: .26855	: .30119	: .00000	* 32	I 31	: .31159	* 2	: 1.16840	: 2	: 1.16840	: 22	: .26129					
* 55.13	: 72.96	: 78.55	: 82.80	: 94.38	: 99.61	: .00	* I	: 99.84	* :	:	:	:	:	:	:	:	:	:	:	:
*****										I*****:*****:*****:*****:*****										

EVOLUTION DE LA CONCENTRATION

INDICES LINDA (L) ET RATIOS DE CONCENTRATION (CR)

* TABLEAU NO 3 *
* *
* 1968 - 1972 *
* *

: UNITED-KINGDOM
ITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
EUR : PHARMACEUTIQUE
EPRISES

VARIABLE : 04 BENEFICE NET

*****							* I * C O U R B E S L																							
* INDICES L ET CR RELATIFS A N* =							* I *****																							
*****							* I ECHANTILLON*1ER MA IMUM : 2EM MAXIMUM: MINIMUM																							
*****							I-----:-----:-----																							
%	:	:	:	:	:	:	N	I	:	L	*N*	:	L	:N*	:	L	:N*	:	L											
*	4	:	8	:	10	:	12	:	20	:	30	:	40	*	I	N*:	N*	*HK:	N*HK	:	H:	N*H	:	M:	N*M					
*	.83833	:	.47394	:	.41979	:	.37787	:	.37469	:	.00000	:	.00000	*	30	I29	:	.99596	*	2	:	1.23547	:	2	:	1.23547	:	18	:	.33354
R	*60.97	:	79.40	:	84.69	:	89.10	:	98.29	:	.00	:	.00	*	I	:	99.99	*	:	:	:	:	:	:	:	:	:	:	:	
*	.90482	:	.54807	:	.51536	:	.48104	:	.38717	:	.00000	:	.00000	*	30	I29	:	.67683	*	3	:	1.19222	:	3	:	1.19222	:	18	:	.38094
R	*65.08	:	81.92	:	86.07	:	89.29	:	97.99	:	.00	:	.00	*	I	:	99.94	*	:	:	:	:	:	:	:	:	:	:	:	
*	.91282	:	.55599	:	.56284	:	.53989	:	.47895	:	.73618	:	.00000	*	31	I30	:	.73618	*	2	:	1.38722	:	2	:	1.38722	:	18	:	.46547
R	*67.05	:	84.88	:	88.49	:	91.19	:	98.09	:	99.93	:	.00	*	I	:	99.93	*	:	:	:	:	:	:	:	:	:	:	:	
*	.85404	:	.60914	:	.61765	:	.57201	:	.47510	:	.00000	:	.00000	*	29	I28	:	.66530	*	2	:	1.31270	:	2	:	1.31270	:	19	:	.47126
R	*68.64	:	85.06	:	88.21	:	90.91	:	97.90	:	.00	:	.00	*	I	:	99.93	*	:	:	:	:	:	:	:	:	:	:	:	
*	.88508	:	.57428	:	.56376	:	.52118	:	.37677	:	.00000	:	.00000	*	30	I29	:	.61312	*	2	:	1.14871	:	2	:	1.14871	:	21	:	.37452
R	*67.12	:	81.71	:	85.35	:	88.39	:	97.47	:	.00	:	.00	*	I	:	99.95	*	:	:	:	:	:	:	:	:	:	:	:	

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EVOLUTION DE LA CONCENTRATION

* TABLEAU NO 3 *
* * * * *
* 1968 - 1972 *
* * * * *

INDICES LINDA (L) ET RATIOS DE CONCENTRATION (CR)

; : UNITED-KINGDOM
TITUT : LONDON BUSINESS SCHOCL (PROF.J.B.HEATH)
TEUR : PHARMACEUTIQUE
REPRISES

VARIABLE : 05 CASH FLOW

*****										*****									
* INDICES L ET CR RELATIFS A N* =										* C O U R B E S L									
* ET *										* I *****									
* CR *****										* I ECHANTILLON*IER MA IMUM : 2EM MAXIMUM: MINIMUM									
* % * : : : : : * N I : L *N* : L :N* : L :N* : L										* I N* : N* * H< : N*H< : H : N*H : M : N*M									
* * 4 : 8 : 10 : 12 : 20 : 30 : 40 * I										* I N* : N* * H< : N*H< : H : N*H : M : N*M									
L * .85846: .48281: .42106: .38508: .34498: .00000: .00000*	30I29 :	.74737*	2 :	1.12455:	2 :	1.12455:	19 :	.33212											
CR *60.92 :78.73 :84.23 :88.39 :97.79 : .00 : .00 *	I :	99.98 *	:	:	:	:	:	:											
L * .94259: .55894: .50876: .48289: .38025: .57895: .00000*	31I30 :	.57895*	3 :	1.21845:	3 :	1.21845:	21 :	.37665											
CR *64.40 :80.92 :85.41 :88.55 :97.23 :99.94 : .00 *	I :	99.94 *	:	:	:	:	:	:											
L * .93605: .56749: .55274: .51697: .43110: .61068: .00000*	31I30 :	.61068*	2 :	1.30379:	2 :	1.30379:	19 :	.42451											
CR *65.80 :83.02 :86.92 :89.84 :97.45 :99.99 : .00 *	I :	99.99 *	:	:	:	:	:	:											
L * .92036: .62021: .61253: .58235: .40286: .57090: .00000*	31I30 :	.57090*	2 :	1.12262:	2 :	1.12262:	22 :	.39890											
CR *66.93 :82.66 :86.01 :88.49 :96.77 :99.99 : .00 *	I :	99.99 *	:	:	:	:	:	:											
L * .70523: .44848: .44320: .39318: .31939: .00000: .00000*	30I29 :	.54537*	3 :	.91062:	3 :	.91062:	19 :	.31683											
CR *61.94 :79.07 :83.30 :87.36 :97.28 : .00 : .00 *	I :	99.99 *	:	:	:	:	:	:											

EVOLUTION DE LA CONCENTRATION

INDICES LINDA (L) ET RATIOS DE CONCENTRATION (CR)

* TABLEAU NO 3 *
* 1968 - 1972 *

S : UNITED-KINGDOM
TITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
TEUR : PHARMACEUTIQUE
REPRISES

PAGE 10

VARIABLE : 07 CAPITAUX PROPRES

INDICES L ET CR RELATIFS A N* =								C O U R B E S L															
								I ECHANTILLON*IER MA IMUM : 2EM MAXIMUM: MINIMUM															
%	:	:	:	:	:	:	:	N	I	:	L	*N* :	L	:N* :	L	:N* :	L						
*	4	:	8	:	10	:	12	:	20	:	30	:	40	*	I	N* :	N* * H< :	N*H< :	H :	N*H :	M :	N*H	
L *	.51633:	.34447:	.31477:	.28624:	.33013:	.00000:	.00000*	30	I 29 :	.71227*	3 :	.65453:	29 :	.71227:	13 :	.26840							
CR *55.93	:77.86	:84.34	:89.49	:98.14	: .00	: .00	*	I	:99.98	*	:	:	:	:	:	:	:	:	:	:	:	:	:
L *	.61680:	.39271:	.35210:	.32514:	.35586:	.65542:	.00000*	31	I 30 :	.65542*	3 :	.74717:	3 :	.74717:	13 :	.30669							
CR *58.58	:78.42	:84.61	:89.18	:97.86	:99.96	: .00	*	I	:99.96	*	:	:	:	:	:	:	:	:	:	:	:	:	:
L *	.55931:	.36600:	.33111:	.30528:	.32586:	.59556:	.00000*	31	I 30 :	.59556*	3 :	.69877:	3 :	.69877:	13 :	.29060							
CR *57.12	:77.20	:83.50	:88.28	:97.53	:99.95	: .00	*	I	:99.95	*	:	:	:	:	:	:	:	:	:	:	:	:	:
L *	.50855:	.34747:	.32685:	.30000:	.29546:	.51998:	.00000*	31	I 30 :	.51998*	3 :	.62486:	3 :	.62486:	15 :	.27932							
CR *56.13	:76.32	:82.24	:87.02	:97.00	:99.93	: .00	*	I	:99.93	*	:	:	:	:	:	:	:	:	:	:	:	:	:
L *	.60784:	.39788:	.36023:	.33389:	.32341:	.57942:	.00000*	31	I 30 :	.57942*	3 :	.74940:	3 :	.74940:	21 :	.31700							
CR *59.28	:78.18	:84.15	:88.60	:97.56	:99.92	: .00	*	I	:99.92	*	:	:	:	:	:	:	:	:	:	:	:	:	:

EVOLUTION DE LA CONCENTRATION

* TABLEAU NO 3 *
* 1966 - 1972 *

INDICES LINDA (L) ET RATIOS DE CONCENTRATION (CR)

S : UNITED-KINGDOM
TITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
TEUR : PHARMACEUTIQUE
REPRISES

VARIABLE : 08 EXPORT.

Table with columns for indices L and ratios CR, and statistical data for 'COURBES L'. Includes rows for L * INDICES L ET CR RELATIFS A N* = and CR % with various numerical values.

TABLEAU STRUCTUREL DES COURBES LINDA

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
SECTEUR : PHARMACEUTIQUE
ENTREPRISES :

ANNEE : 1969

* * * * * V A R I A B L E * * * * *										
* N°	* CHIFFRE * * D'AFFAIRES *	* EFFECTIF *	* MASSE * * SALARIALE *	* BENEFICE * * NET *	* CASH * * FLOW *	* CAPITAUX * * PROPRES *	* EXPURT. *	* *	* *	* *
* 2 *	* .89350 *	* 1.38758 *	* 1.31200 *	* 1.14692 *	* 1.06507 *	* .61318 *	* 1.49487 *	* *	* *	* *
* 3 *	* 1.05665 *	* .91572 *	* .90230 *	* 1.19222 *	* 1.21845 *	* .74717 *	* .90716 *	* *	* *	* *
* 4 *	* .89408 *	* .85009 *	* .71662 *	* .90482 *	* .94259 *	* .61680 *	* .70148 *	* *	* *	* *
* 5 *	* .74533 *	* .72809 *	* .62670 *	* .71817 *	* .72332 *	* .49394 *	* .60684 *	* *	* *	* *
* 6 *	* .63788 *	* .63713 *	* .53768 *	* .64616 *	* .64454 *	* .44089 *	* .51713 *	* *	* *	* *
* 7 *	* .54979 *	* .56621 *	* .49334 *	* .55858 *	* .58056 *	* .42711 *	* .44147 *	* *	* *	* *
* 8 *	* .51421 *	* .52317 *	* .48003 *	* .54807 *	* .55894 *	* .39271 *	* .38178 *	* *	* *	* *
* 9 *	* .48142 *	* .50541 *	* .44599 *	* .53136 *	* .51647 *	* .35519 *	* .33293 *	* *	* *	* *
* 10 *	* .44707 *	* .47562 *	* .41170 *	* .51536 *	* .50876 *	* .35210 *	* .32231 *	* *	* *	* *
* 11 *	* .43494 *	* .44340 *	* .38177 *	* .50100 *	* .49353 *	* .33988 *	* .30558 *	* *	* *	* *
* 12 *	* .41156 *	* .41406 *	* .35974 *	* .48104 *	* .48289 *	* .32514 *	* .29578 *	* *	* *	* *
* 13 *	* .38957 *	* .39714 *	* .33516 *	* .46212 *	* .46371 *	* .30669 *	* .29440 *	* *	* *	* *
* 14 *	* .37345 *	* .37795 *	* .31961 *	* .44148 *	* .44277 *	* .30784 *	* .28677 *	* *	* *	* *
* 15 *	* .35437 *	* .36079 *	* .29963 *	* .42141 *	* .42651 *	* .31885 *	* .27751 *	* *	* *	* *
* 16 *	* .35868 *	* .35273 *	* .29470 *	* .40990 *	* .41043 *	* .32770 *	* .27634 *	* *	* *	* *
* 17 *	* .35488 *	* .34025 *	* .28587 *	* .39561 *	* .39855 *	* .33028 *	* .27290 *	* *	* *	* *
* 18 *	* .34915 *	* .32972 *	* .28236 *	* .38094 *	* .38764 *	* .33892 *	* .26894 *	* *	* *	* *
* 19 *	* .34472 *	* .31740 *	* .27557 *	* .38681 *	* .37949 *	* .35077 *	* .27113 *	* *	* *	* *
* 20 *	* .33812 *	* .30519 *	* .27202 *	* .38717 *	* .38025 *	* .35586 *	* .26891 *	* *	* *	* *
* 21 *	* .33107 *	* .29855 *	* .26612 *	* .40005 *	* .37665 *	* .36796 *	* .26541 *	* *	* *	* *
* 22 *	* .32231 *	* .29806 *	* .25900 *	* .40382 *	* .38884 *	* .37550 *	* .27212 *	* *	* *	* *
* 23 *	* .33033 *	* .29511 *	* .27249 *	* .45818 *	* .39494 *	* .41121 *	* .28947 *	* *	* *	* *
* 24 *	* .34434 *	* .29643 *	* .28030 *	* .49738 *	* .41857 *	* .44979 *	* .30516 *	* *	* *	* *
* 25 *	* .35544 *	* .30624 *	* .28489 *	* .52721 *	* .44892 *	* .47475 *	* .32017 *	* *	* *	* *
* 26 *	* .36249 *	* .31361 *	* .28679 *	* .54606 *	* .48071 *	* .50940 *	* .33754 *	* *	* *	* *
* 27 *	* .37564 *	* .32240 *	* .29141 *	* .57519 *	* .50358 *	* .54943 *	* .34795 *	* *	* *	* *
* 28 *	* .38276 *	* .33021 *	* .29282 *	* .62170 *	* .52549 *	* .59044 *	* .35474 *	* *	* *	* *
* 29 *	* .39145 *	* .33540 *	* .30077 *	* .67683 *	* .54415 *	* .61802 *	* .40614 *	* *	* *	* *
* 30 *	* .41243 *	* .34692 *	* .31700 *	* *	* .57895 *	* .65542 *	* .60122 *	* *	* *	* *

TABLEAU STRUCTUREL DES COURBES LINDA

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
SECTEUR : PHARMACEUTIQUE
ENTREPRISES

ANNEE : 1971

* * * * * V A R I A B L E * * * * *									
* N°	* CHIFFRE	* EFFECTIF	* MASSE	* BENEFICE	* CASH	* CAPITAUX	* EXPORT.	*	*
* *D'AFFAIRES*	* SALARIALE	* NET	* FLOW	* PROPRES*	*	*	*	*	*
* *	* *	* *	* *	* *	* *	* *	* *	* *	* *

* 2 *	.85763	1.25913	1.14508	1.31270	1.12262	.51891	1.41698	*	*
* *	=====	=====	=====	=====	=====	=====	=====	*	*
* 3 *	1.05233	.89968	.89680	1.09717	1.09307	.62486	1.04169	*	*
* *	=====	=====	=====	=====	=====	=====	=====	*	*
* 4 *	.85883	.83647	.76550	.85404	.92036	.50855	.77413	*	*
* 5 *	.76031	.70762	.63062	.70312	.72845	.44124	.62583	*	*
* 6 *	.64171	.61893	.51644	.62010	.64061	.39884	.54022	*	*
* 7 *	.53945	.52985	.45645	.57995	.60803	.37954	.48578	*	*
* 8 *	.48311	.50337	.41789	.60914	.62021	.34747	.42875	*	*
* 9 *	.45614	.46117	.40070	.61643	.59594	.32925	.37862	*	*
* 10 *	.43110	.41805	.37539	.61765	.61253	.32685	.34982	*	*
* 11 *	.41701	.39526	.34841	.59578	.60216	.31142	.32292	*	*
* 12 *	.39533	.38424	.33513	.57201	.58235	.30000	.31531	*	*
* 13 *	.37773	.36706	.32190	.55690	.55423	.28668	.30650	*	*
* 14 *	.36328	.35458	.30563	.53898	.52344	.28553	.30826	*	*
* 15 *	.35381	.34455	.29092	.51857	.49378	.27932	.31036	*	*
* *	*	*	*	*	*	-----	*	*	*
* 16 *	.35008	.33747	.28801	.49514	.47641	.29024	.30612	*	*
* 17 *	.34588	.32933	.28762	.47330	.45570	.29167	.30447	*	*
* 18 *	.34318	.31900	.28206	.47141	.43530	.29568	.30334	*	*
* 19 *	.34052	.31099	.27582	.47126	.41832	.29664	.30168	*	*
* *	*	*	*	-----	*	*	*	*	*
* 20 *	.33401	.30294	.27107	.47510	.40286	.29546	.29759	*	*
* *	*	*	*	*	*	*	-----	*	*
* 21 *	.33101	.29425	.26519	.48662	.39898	.29369	.30077	*	*
* 22 *	.32843	.29141	.26157	.49271	.39890	.28934	.31286	*	*
* *	-----	-----	-----	-----	-----	-----	-----	*	*
* 23 *	.33191	.29331	.26877	.49456	.40674	.32448	.31814	*	*
* 24 *	.34098	.29183	.27523	.50333	.41114	.35493	.32093	*	*
* 25 *	.35181	.29760	.27888	.52763	.41131	.38203	.32934	*	*
* 26 *	.35727	.30360	.28154	.56170	.42953	.41061	.33265	*	*
* 27 *	.37325	.30546	.28653	.59580	.45908	.44324	.35329	*	*
* 28 *	.38794	.30500	.29426	.66530	.48378	.47060	.37910	*	*
* 29 *	.39846	.31667	.30522	*	.50773	.49087	.40627	*	*
* 30 *	.41546	.32911	.31244	*	.57090	.51998	.65328	*	*
* *	*	*	*	*	*	*	*	*	*

CONCENTRATION INDUSTRIELLE

* TABLEAU NO 3BIS *

TABLEAU STRUCTUREL DES COURBES LINDA

PAYS : UNITED-KINGDOM
INSTITUT : LONDON BUSINESS SCHOOL (PROF. J.B. HEATH)
SECTEUR : PHARMACEUTIQUE
ENTREPRISES

PAGE 10

ANNEE : 1972

* * * * * V A R I A B L E * * * * *										
* N°	* CHIFFRE * D'AFFAIRES*	* EFFECTIF *	* MASSE * SALARIALE *	* BENEFICE * NET *	* CASH * FLOW *	* CAPITAUX * PROPRES*	* EXPORT. *	* * *	* * *	* * *

* 2 *	.80543	1.25870	1.16840	1.14871	.74992	.60792	1.11381	*	*	*
* 3 *	1.05697	.87266	.86962	1.11409	.91062	.74940	.93478	*	*	*
* 4 *	.88526	.81253	.79102	.88508	.70523	.60784	.67705	*	*	*
* 5 *	.77224	.68671	.63804	.84500	.65494	.52941	.56940	*	*	*
* 6 *	.65942	.60356	.54749	.72646	.56917	.47427	.49430	*	*	*
* 7 *	.55786	.55735	.46753	.63665	.49228	.42449	.46125	*	*	*
* 8 *	.49841	.50440	.41804	.57428	.44848	.39788	.41392	*	*	*
* 9 *	.44139	.45663	.39912	.57363	.46000	.36377	.36963	*	*	*
* 10 *	.42607	.41911	.36915	.56376	.44320	.36023	.33536	*	*	*
* 11 *	.41480	.39631	.35771	.53642	.41773	.34542	.30929	*	*	*
* 12 *	.39803	.37784	.34085	.52118	.39318	.33389	.29824	*	*	*
* 13 *	.37620	.35899	.32265	.49934	.37040	.32695	.28738	*	*	*
* 14 *	.36017	.34672	.30694	.47580	.37101	.31994	.29331	*	*	*
* 15 *	.34722	.33145	.29045	.44986	.36204	.33021	.29407	*	*	*
* 16 *	.34055	.32209	.28332	.42409	.35122	.33721	.29013	*	*	*
* 17 *	.33591	.31540	.28329	.40646	.33934	.33595	.28739	*	*	*
* 18 *	.33794	.30953	.28053	.38830	.32670	.33012	.29241	*	*	*
* 19 *	.33682	.30095	.27467	.38001	.31683	.32766	.29206	*	*	*
* 20 *	.33112	.29201	.26855	.37677	.31939	.32341	.29650	*	*	*
* 21 *	.32400	.28894	.26475	.37452	.31953	.31700	.29946	*	*	*
* 22 *	.32600	.28538	.26129	.39934	.33495	.36180	.29901	*	*	*
* 23 *	.32910	.28469	.26547	.41391	.35028	.39943	.30636	*	*	*
* 24 *	.33200	.28441	.27114	.42300	.36171	.42573	.32022	*	*	*
* 25 *	.34764	.29113	.27321	.43579	.38332	.44709	.33557	*	*	*
* 26 *	.36184	.29442	.28185	.45972	.41123	.48031	.35117	*	*	*
* 27 *	.37805	.29940	.28549	.50542	.45234	.50695	.37425	*	*	*
* 28 *	.38922	.31437	.28921	.54165	.48277	.53563	.39119	*	*	*
* 29 *	.40191	.32427	.29496	.61312	.54537	.55463	.43658	*	*	*
* 30 *	.42318	.33038	.30119	*	*	.57942	.64711	*	*	*

CONCENTRATION PROJECT

Report by Professor J.B. Heath and associates
of the London Business School

on the

PHOTOGRAPHIC FILM INDUSTRY

Research Team:

November 1975

Professor J.B. Heath (Project Leader)

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1. INDUSTRY DEFINITION

In the U.K. the industry definition which corresponds most closely to NICE 313.2 is Photographic Chemical Materials (Standard Industrial Classification 297.7) which embraces all types of sensitised materials of following types: plates for medical X rays, micro film, cine film, document copying and photography. The industry also includes chemical products for film processing. It is difficult to separate the chemicals for the photo sensitive materials because companies do not separate these activities in their accounts; the fact that most companies regard these activities as complementary is a good reason for grouping them together.

2. NOTES ON SOURCES

The industrial census in 1971 identifies 12 enterprises each employing more than 25 employees with aggregate gross sales in 1971 of £107 million with a size distribution set out in Table 1. We have decided to include 9 of these companies for financial analysis. The comparison of our coverage and that of the census is also indicated in Table 1. The discrepancy in coverage arises from the fact that the census is based on returns from individual establishments whereas our figures relate to enterprises. Despite the fact that we have included fewer companies than the census, their aggregate gross sales exceed the census figure. This is probably due to the inclusion of sales of photographic equipment which most companies in the industry manufacture as well. Where possible we have tried to isolate the photographic materials component of turnover.

TABLE 1: COVERAGE OF REPORT

<u>Number of Employees in Each Establishment</u>	<u>1971 Census of Production</u>		
	<u>Number of Establishments</u>	<u>Number of Enterprises</u>	<u>Sales (£ '000)</u>
25 - 299	3	3	2,100
300 - 499	4	3	15,700
500 - 1,499	3	3	21,200
over 1,500	3	3	68,200
TOTAL	13	12	107,000
Scope of Industry Definition in Study used	-	9	135,000

In general we have included companies which specialise in photographic materials and excluded those which do not. Statistically speaking, this is the only sensible procedure, but there must be some doubt about the economic significance of the aggregate derived in this way. It happens that the companies which provide the main source of actual and potential competition to the industry leader, Kodak, are excluded by this procedure, namely, Polaroid, Minnesota Mining & Manufacturing, and the many importers. But photographic materials account for only a small component of these companies' sales, so that if they were all included in their entirety the 'industry' sales in this industry would have been roughly twice as large as the known market. The inference to be drawn from this difficulty is that the industry definition adopted here is of dubious analytical significance since it fails to group companies known to be in direct competition with each other.

TABLE 2: COMPANIES IN THE INDUSTRY

<u>Company</u>	<u>1972 Sales</u> (£ '000)	<u>Notes</u>
Kodak	132,6 { 98,500 34,100	Subsidiary of Eastman Kodak.
Ilford		Subsidiary of Ciba-Geigy since 1969.
Gratispool	4,400	Wholesaler.
Smith & Nephew Plastics	2,500	Specialist manufacturers of plastic film.
	139,500	
Criterion Graphic Products	1,700*	Subsidiary of Ozalid.
G.A.F. (Great Britain)	900**	Subsidiary of G.A.F. U.S.A.; photographic materials form a minor part of their U.K. activities.
H.P.L. Johnsons***	700**	Subsidiary of Hestair since 1971; primarily a distributor.
Synthite***	600	Subsidiary of Tennants.
Kentmere	200**	Primarily a printing company.
Industry Sales 1972 (£ '000)	<u>151,000</u>	

* Annual sales based on nine months activities.

** Estimated sales of photographic materials in cases where this is a minor part of the business.

*** Primarily a manufacturer of chemicals used in photographic film manufacture or processing.

TABLE 3: INDUSTRY SALES, STRUCTURE AND PROFITABILITY

<u>Year</u>	<u>Industry Sales*</u> (£ mill)	<u>Kodak's Share</u> (%)	<u>Kodak's Profit**</u> <u>on Sales</u> (%)	<u>The Rest of t</u> <u>Industry's Pro</u> <u>on Sales</u> (%)
1968	107	63	22	5
1969	114	64	26	7
1970	125	64	22	6
1971	135	64	22	3
1972	151	65	21	5

* Companies in Table 2.

** Pre-tax pre-interest.

Source: Company accounts.

4. MARKET STRUCTURE

As is evident from Table 2 and Table 3, any discussion about the British photographic film industry is really a discussion about Kodak. Kodak accounts for 65% of the sales of the companies mentioned in Table 2. Kodak's precise share of the U.K. market is also high; on the basis that the U.K. market is equal to the industry's output, less exports plus imports, we estimate that the U.K. market in 1971 was £80 million exclusive of the dealer's margins, which probably account for another £20 to £25 million. Of this market Kodak accounted for 70 to 75%. This figure is consistent with those provided by independent sources; Table 4 shows estimates of Kodak's share of the film markets for both still and cine photography. The most important section of these markets is the expenditure on amateur photography which was £110 million in 1971, of which £25 million was accounted for by films, £50 million by processing. As will be seen later, Kodak is heavily involved in both activities.

TABLE 4: MARKET SHARES IN PHOTOGRAPHIC FILM (%)

<u>Company</u>	<u>1971</u>		<u>1973</u>	
	<u>Still</u>	<u>Cine</u>	<u>Still</u>	<u>Cine</u>
Kodak	73	74	71	72
Ilford	13	10	8	7
Agfa-Gevaert	10	8	9	6
Boots	5	-	7	5
Gatispool	-	6	3	3
	<u>100</u>	<u>=</u>	<u>=</u>	<u>=</u>

Source: I.P.C. Marketing Manual.

The structure of the industry, indicated in Table 2, reveals that of British manufacturing companies, only Ilford is of a size to have a chance of offering Kodak any serious competition. The type of competition that it offers and the reason for it doing so are discussed below. The remaining companies are specialists; film manufacturers like Smith & Nephew and Criterion Graphic; chemicals manufacturers and wholesalers like Gatispool, Johnsons and Sythite. In a number of cases, the company is mainly engaged in some other activity. Apart from Ilford's black-and-white film activities, one could generalise by saying that Kodak's U.K. rivals which fall within the industry definition compete either in films for specialist uses or in photographic chemicals, a market which in 1971 accounted for £6 million, or less than 10% of the total photographic materials market. In other words, they live with Kodak by avoiding head-on competition.

Kodak's only serious competition comes from abroad and from Polaroid. Imports took around 30% of the U.K. photographic film market, nearly half of which is accounted for by Kodak's main European rival, Agfa-Gevaert. In other words, Agfa hold around 15% of the U.K. photographic film market, to Kodak's 75%. As Table 5 indicates, Kodak is the sole manufacturer of film for the mass market in the U.K., apart from Ilford which specialises in monochrome film⁽¹⁾. Even the major photographic retailers, Dixons and Boots, which are the most accessible market for a U.K. supplier since no marketing expenses are involved in supplying own-packet products, obtain their sources from abroad.

(1) Ilford export some colour film in an unbranded form to the U.S.A.

TABLE 5: SOURCES OF COMPETITION IN THE U.K. PHOTOGRAPHIC FILM MARKET

<u>Company</u>	<u>Product's Country of Origin</u>	<u>Black & White</u>	<u>Colour</u>	<u>Cine Black & White</u>	<u>Cine Colour</u>
Kodak	U.K.	x	x	x	x
Agfa-Gevaert	West Germany	x	x		x
Ilford (CIBA-GEIGY)	U.K.	x			
Fuji	Japan		x	x	x
G.A.F.	U.S.A.		x		
Perutz	West Germany		x	x	
Orwo	East Germany	x	x	x	
Free Film Service	Italy		x		
Dixon*	Italy	x	x		
Boots*	U.S.A.	x	x		

* U.K. retailers.

THE MARKET

The largest segment of the industry's market is provided by amateur photography. We estimate that in 1971 this market absorbed over 60% of the industry's output so it is trends in this market that are of chief interest. It is not a high growth market. In retail terms, expenditure on amateur photography rose by 80% to £110 million in the 9 year period from 1962 to 1971, growing at a rate of less than 3% a year in real terms. In 1968 probably 60% of British households owned a camera, in line with most European countries, compared to 10 to 15% in 1945. In 1968 the camera-owning population of 14 million was split as follows:

Serious amateurs	0.8 million	6%
Amateurs	3.5 million	25%
'Snapshotters'	9.7 million	69%
TOTAL	14.0 million	100%

This market was served by the following outlets: 1,800 photographic dealers, 13,500 chemists and 7,700 stores/kiosks, making a total of

The significant changes in recent years have been as follows:

- (1) The decline of photography as a hobby and with it the high cost/low volume cameras with their sophisticated controls. Over the period 1965 to 1971, total apparatus sales fell 35% from £39 million to £25 million. Sales of still cameras in terms of units sold fell as well.
- (2) Associated with (1) is a diminished need for photographic dealers capable of serving this market. Many of the dealers have switched instead to electronic equipment which has tended to replace serious photography.
- (3) The development of cheap, easy-to-use cameras which are regarded by consumers as a simple, convenient, cheap accessory, rather than a piece of equipment of interest in its own right.
- (4) The replacement of black-and-white photography with colour photography. Between 1965 and 1969 expenditure on colour photography rose by over 100% of £55 million in 1969 while expenditure on black-and-white photography fell by 40% to less than £10 million in 1969. Colour photography is the only growth element in this market.

These trends have been variously interpreted:

- (1) The Photographic Dealers Association regard price-cutting in the retail market as the reason for the decline. Low returns have driven many dealers out of business or forced others to abandon the technical back-up that serious photographers require, both of which are held to encourage the latter to drift away into other consumer durable markets.
- (2) Another view is that heavy advertising has encouraged 'passive' pastimes such as listening to audio equipment, at the expense of the 'creative' pursuits such as photography which, being a fragmented industry, is unable to organise the advertising needed to combat these forces.

Neither interpretation is very plausible. The simple truth is that much of the dealer population in the mid-1960s was superfluous, buoyed up as it was by margins of 33%, which are justified in a specialist equipment business but not in a straightforward high-volume cameras and film business which any retailer is equipped to handle. A more probable explanation for the switch from specialist photography to convenience photography and electronics lies in the technical progress in photography. The perfection of automatic exposure and films which are faster, sharper and more tolerant of errors in camera settings have tended to demystify photography, rendering redundant many of the technical skills of both photography enthusiasts and photographic dealers alike, at a time when technical developments were making audio equipment more interesting to those to whom complex equipment has an appeal.

KODAK'S DOMINANT POSITION

The most interesting feature of the industry is, of course, the position of Kodak; how it achieved market leadership, how it maintains it, and the implications that these phenomena have for anti-trust policies. It is useful to consider first some of the reasons for Kodak's success, which is apparent from Table 3, which shows that Kodak's profit margin on sales has been maintained above 20%, compared to 5% for the rest of the industry. Kodak's corporate strategy is composed of three main elements: technical leadership, exploitation of growth markets and market leadership.

TECHNICAL LEADERSHIP

Kodak has maintained a technical lead for nearly 100 years. The company was founded in the U.S.A. in 1880 by George Eastman who invented roll films, daylight loading and cheap cameras before 1900. Kodak Limited, the U.K. subsidiary, was founded in 1898. Between the wars Kodak experimented for a long time, like many other photographic film companies, to perfect colour film. In 1935 it produced a significant development on which the company's present supremacy in colour film is ultimately based - Kodachrome. This product embodied a system whereby the dyes were introduced at the processing stage - known as the non-substantive system,

unsuccessfully, to develop, whereby the dyes were contained within the layers of emulsion of the film itself. Later Kodak perfected this process too, leading to Kodacolor and Ektachrome. There are two other strands to Kodak's technical development, processing and cameras. During the Second World War Kodak's research efforts were directed towards simplifying and automating the processing stage so that it could be carried out by armed forces in field conditions. This led to the development of Ektachrome which unlike most other Kodak films was, and still is, sold exclusive of processing costs, intended for use by enthusiasts who would either do their own processing or use the services of professional finishers. Kodak supply the processing kits for this purpose. When Kodak introduced Kodacolor the company realised that the processing costs, using the equipment then available, would inhibit sales and accordingly it developed a semi-automatic printing machine which it later made available to finishers.

Kodak also tackled cameras themselves. They are reputed to spend £0.5 million on market research in Britain annually. One result of this research was the finding that the loading of the camera presented the casual photographer with more problems than any other aspect of photography. Accordingly, Kodak developed and introduced the Instamatic range of still cameras, exclusively designed to accept Kodak film cartridges, followed by Instamatic cine cameras and self-threading projectors, all in the 1960s. Some of Kodak's inventions are patented and offered to competitors under licence. Others remain private to Kodak; for example, the processing technique used in connection with Kodak's best selling colour film, Kodachrome, is maintained a secret by Kodak's practice of reserving to itself the processing of this film. By the time Kodak's patents expire the company has usually developed a new film with new processing requirements.

GROWTH MARKETS

Kodak make good use of their technical capability by directing it into profitable high growth areas. There are two elements here:

- (1) Identifying high-growth high-volume markets for simpler, more

- (2) Seeing to it that Kodak's developments in the three segments of its business - cameras, films and processing - are mutually reinforcing

The market trends mentioned earlier indicate that colour film is the growth sector in an otherwise stagnant market. It was also shown that photography was becoming simpler for the amateur and that this trend was rendering redundant a good many of the specialist photographic dealers, whose livelihood depended on the need for technical advice. Kodak anticipated and accelerated both these trends, being first-to-market with colour film in 1935, one year before Agfa, and maintaining its lead ever since⁽¹⁾

Kodak's operations reinforce each other. Put at its crudest, a camera is a vehicle for selling film and films are a vehicle for selling processing. Kodak's Instamatic range of cameras are designed exclusively for Kodak's easy-to-load cartridges. Kodak's films are usually sold inclusive of processing; in 1964 the processing of its three main colour films brought Kodak business equal to 75% of the sales value of these films themselves. In respect of films which Kodak does not process, the processing technology, chemicals and apparatus is made available to the photographic finishing trades.

MARKET LEADERSHIP

Kodak does not aim to sell its products at the lowest price in the market; it aims at a price which renders its product the best value for money in the market. The British Consumers' publication, 'Which?', tested 17 colour films available in Britain in 1975 in collaboration with consumer associations in five other European countries. Tests were carried out in 35 mm film in a laboratory and in open air conditions, in winter and summer. Films were sent for processing at the manufacturer's own laboratories. Colour slides were analysed in the laboratory by a panel of viewers in respect of several dimensions - sharpness, graininess, exposure latitude and colour correctness. The quality of the slides was

(1) History repeats itself. In the Consumers' Association report on colour film, referred to more fully later in the text, it was noted that '... were also able to buy the new Kodachrome 25 and Kodachrome 64 films... buying them in the U.S.A. before they were released here. Unfortunately

assessed in the light of the unit cost, taking into account the processing cost where this was not included in the price of the film.

Table 6 summarises the results of this report. Kodak emerged the best from these tests, even allowing for the fact that it 'entered more competitors' than any other company. The 35 mm films are the chief interest here as they were the subject of the tests; other film sizes are simply different versions of the 35 mm variety. The report singles out four films out of seventeen as being best value for money, Kodak being responsible for three of them.

TABLE 6: VALUE FOR MONEY IN COLOUR FILM

<u>Size of Film</u>	<u>Manufacturer</u>	<u>Number of Varieties Offered</u>	<u>Number Selected by Consumers' Panel</u>
35 mm	Kodak	6	3
	Others	11	1
126	Kodak	3	2
	Others	7	0
110	Kodak	3	2
	Others	0	0
120	Kodak	2	1
	Others	3	1

Source: 'Which?', August 1975, Consumers' Association, London.

The only non-Kodak film selected was Orwochrome from East Germany. It owed its selection to its cheapness rather than its quality, which was in fact fairly ordinary. One suspects that its cheapness was determined more by the Comecon desire for foreign exchange than by its production costs. This is not to say that it is not value for money; simply that in the context of this comparison between companies' ability to offer value for money in competitive conditions this item should be discounted.

The reason for Kodak's price strategy is its desire to build up volume. Once having launched a product, Kodak tends to maintain a stable price over a number of years. Thus, for example, Kodak prices on colour film remained stable during the seven year period 1958 to 1964, over which the Retail Price Index rose by 40%. More recently the price index

of photographic film rose by 32% between 1970 and 1974 while the Retail Price Index rose over 50%. The accumulated volume that these pricing policies generate enables Kodak to reduce its unit costs. A policy of holding the price for each product fairly stable while reducing unit costs as volume accumulates tends to result in increasing profitability for each product during its commercial life. It is noticeable from data compiled by the Monopolies Commission⁽¹⁾ that the relative profitability of Kodak's three main colour films bore some relation to their maturity. Kodachrome, which was introduced to the British market soon after the war earned 35% on sales in 1964; Ektachrome and Kodacolor, introduced 10 years later, earned 24% and 18% respectively.

Kodak reinforces its dominant position through its leverage with its dealers. Kodak sales representatives are able to ensure that photographic dealers give its products a prominent display. Withdrawal of supply of Kodak products spells the end of a dealer's business.

Most students of business would endorse Kodak's strategy as the correct one; it ensures long run profitability, growth and market leadership. It makes an optimal use of Kodak's technical superiority because by the time rivals have caught up with any particular technical innovation they will be unable to match Kodak's unit manufacturing and processing costs, which by that time will have been reduced as a result of the volume achieved and the experience acquired in the intervening years. In this way Kodak combines high profitability with market leadership.

THE INVESTIGATION OF KODAK BY THE MONOPOLIES COMMISSION

The resounding success of this strategy attracted the attention of the British Government and in 1965 the supply of colour film (i.e. Kodak) was referred to the Monopolies Commission for investigation⁽²⁾. In 1964 Kodak accounted for 77% of the U.K. market for colour film; there was only one other indigenous competitor, Ilford, with a market share of less than 4%. In the six previous years, 1959 to 1964, Kodak's profit margin on the supply and processing of colour film moved in the range of 26 to 31%, its return on capital in the range of 37 to 56%.

(1) & (2) Colour Film. The Monopolies Commission HMSO 1966

The Monopolies Commission came to the following conclusions:

- (1) Kodak's success with colour film in the U.K. was due to its reputation, enterprise and efficiency and its innovations in colour film. It was also due to the adverse effects of the Second World War on the competition and the 20% tariff surrounding the U.K. market in 1965.
- (2) Kodak's high profits were in part due to its monopoly position and were argued to be against the public interest.
- (3) Kodak's policy of selling colour film on a process-inclusive basis was contrary to the public interest.

The Commission made five main recommendations:

- (1) The tariff on colour film should be abolished, to permit greater competition from Kodak's overseas rivals.
- (2) Kodak should reduce its prices on colour film.
- (3) Kodak should reduce the distributors' margins on colour film.
- (4) Kodak should make its colour film available to any dealer subject to the usual creditworthiness considerations.
- (5) Film should be sold in such a way as to enable retailers to sell on a process paid basis or not, as the customer required.

All except the last of these recommendations were fulfilled to a greater or lesser degree, for a variety of reasons. The intervention of the British Government resulted in a reduction of Kodak's prices. Tariffs were reduced as a result of the Kennedy Round and later by the entry of the U.K. into the E.E.C. Distributors margins were reduced as a result of the enactment of the Resale Price Maintenance Act 1964 which prohibited suppliers from stipulating the retail price of their products and opened the way for price competition at the retail level. Kodak did in fact

because of the change in strategy in favour of high-volume low-cost photography, following the successful introduction of the Instamatic range of cameras.

Two aspects of the Monopolies Commission's analysis are commented on here - the conclusion that high profitability is due to Kodak's monopoly position and the recommendation that Kodak should cease to quote prices for colour film on a process-inclusive basis. In arguing that market dominance was the cause of excessive profits the Commission did not fully appreciate the origins of these profits. They did not arise from Kodak first gaining a dominant position and then putting up its prices to exploit that position; they arose from the combination of technical leadership and its exploitation through low and stable prices, designed to achieve a high market penetration. The accumulated volume and experience derived from this strategy reduced unit costs, yielding above-average profits. The implications of this are discussed below.

PROCESS-INCLUSIVE PRICES

Like many other colour film suppliers, Kodak has reserved the processing of colour film to itself by selling some of its films only at a process-inclusive price. The Monopolies Commission argued that these terms of sale operated against the public interest since it excluded competition from processing. This is a material point for, as we have seen, amateur photographers spend twice as much on processing as on the films themselves. Eastman Kodak in the U.S.A. was compelled under the Sherman Act to sell Kodachrome and Kodacolor exclusive of processing. Its U.S. rivals are under no such obligation. The Monopolies Commission recommended that Kodak be asked to abandon inclusive prices in the U.K., but this has not occurred. There are four reasons for the practice: to maintain processing standards, to safeguard process technology, to ensure a sufficient volume of processing to bring down the unit processing costs and, of course, to secure profitable business at no additional marketing cost.

The Monopolies Commission argued against this practice on principle, the principle apparently being that it is undesirable to exclude competition from an important market. But the substantive issue is whether the

would otherwise make, and whether it raises the price of processing. Neither is very probable; as to the question of choice, Kodak caters for the enthusiasts who wish to develop film themselves with Ektachrome. As regards the cost of processing to the public, the likelihood that professional processors would be able to improve on Kodak's quality and price is remote indeed. The history of the industry indicates that technical advances in processing have invariably derived from the film makers, who can afford the extensive research, and not from the fragmented independent processing industry. Furthermore, Kodak can secure scale economies, by virtue of its position as a film manufacturer, not available to finishers, even if films were not sold at a process-inclusive price.

The practice is fairly common in the industry, which regards processing as an integral part of the business of producing finished colour prints - a process in which the customer's purchase and use of film is merely an intermediate step. It is not only the established suppliers which sell on this basis; a recent new entrant into the U.K. market, the Free Film Service, offering very cheap Italian film, also links the purchase of the film and processing, but does so in the reverse direction. The customer only pays for film processing and, when he does so, receives a 'free film'. This is an ingenious marketing gambit because the film is apparently free and its presentation to the customer commits him to more processing, which in turn provides him with another film, and so on. In short, the practice is a custom in the trade, has many technical features to recommend it, and is probably harmless from the competition point of view in that it places a restriction on a development which is unlikely to occur in any case.

THE EFFICIENT MONOPOLIST SITUATION

This case is interesting because it provides a perfect illustration of the basic paradox of anti-trust policy. The paradox is this: competition is regarded as desirable because it encourages growth and profitability through efficiency. But if it succeeds too well one company eventually emerges as more efficient than all the rest and will tend to drive out its competitors. What should anti-trust authorities do about this? If the monopolist's dominant position is maintained by anti-competitive

lies open to the authorities if the dominant position is the result of superior efficiency? If the monopolist is ordered to cut prices the few rivals that remain will be driven out of business. This is precisely what happened in this industry. The price reductions which were made as a result of the Monopolies Commission recommendations hastened the departure of Kodak's one remaining British competitor in the colour film business, Ilford, which withdrew first from retailing, supplying instead the larger retail chains; it now supplies the 'free film' market indirectly and specialises in monochrome film and chemicals. One consequence of the anti-trust measure, then, was to contribute to the elimination of the indigenous competition.

Anti-trust authorities have ultimately to decide whether they wish to preserve competition or regulate prices. They cannot do both as there is a trade-off between these two objectives. If, as in this case, competition is already too weak, price regulation can be regarded as substitute for effective competitors. The disadvantage of this option is that in the long run it inhibits the real benefits that the public derives from the growth of large efficient competitors. As we have seen, Kodak owes its position to the fact that its unit costs are lower than those of its rivals. Part, but not all, of this reduction in unit cost is passed on to the consumer; but regardless of what proportion is passed on, the savings in resource cost is entirely a benefit to the community. These kinds of benefits may be foregone to some extent if Government agencies interfere with the competitive process; that is to say, if the efficient monopolist anticipates that anti-trust action will deprive it of some of the rewards of the penetration price/scale economies strategy outlined above, it may instead opt for a different strategy altogether, namely, milking profits from its technical developments as rapidly as possible with high prices, before anti-trust investigations can be initiated and completed. The community would lose the unit-cost advantages if dominant companies were driven in this direction. These considerations indicate that there is no simple or clear answer to the problem which the efficient monopolist poses to anti-trust authorities.

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Leuvenseweg 40-42
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CCP 000-2005502-27 –
Postrekening 000-2005502-27

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