

Chapter III

Market Structure and Pricing Policy of Antibiotic Drugs

This chapter aims to analyze the nature of the existing antibiotic drugs industry considering in the market structure and pricing policy. It is a complex topic, with a number of concepts to fit together and a large volume of data to evaluate. The main issues are as follows: 1) What are the main elements of sample antibiotic drug market structure? 2) How do they relate? and 3) What are the main types of sampled antibiotic drug market structure?

Measurement of Market Structure.

1. Market structure by firm share.

The structure is embodied mainly in the size distribution of the competing firms. The method here first uses market share and concentration (four firm concentration ratio) to a presumptive category. This presumption can then be modified by evidence about pricing policy.

The standards used for the four categories are as follows(Shephard, 1985 : 73):

a) Pure monopoly : market share at or near 100% plus evidence of effective monopoly control over the level and structure of prices (e.g. patented drugs.)

b) Dominant firms : a market share of one firm of 50 to over 90%, with no close rival. An ability to control pricing, to set systematic discriminatory prices and to influence innovation.

c) Tight oligopoly : four-firm concentration above 60%, with stable market shares. A tendency toward cooperation, shown especially by rigid prices.

d) Effective competition : four-firm concentration below 40%, with unstable market shares and flexible pricing. Little collusion and low profit rates.

Consider the market structure of each sample antibiotic drugs, the leaders' market share and four-firm concentration ratio are calculated as shown in Table 3.1 and Figure 3.1. Three type of firms are classified as follows:

1. Pure Monopoly i.e. thiamphenicol injection ,cefsulodin injection, spiramycin injection and azteonam injection.

2. Dominant Firm i.e. pefloxacin injection and pefloxacin tablet.

3. Tight Oligopoly i.e. cloxacillin capsule, tetracycline capsule, cephalixin capsule and amikacin injection.

The generally characteristic feature of monopoly is that there is only one firm in the industry. It follows, therefore, that the demand curve facing the monopolist is the market demand curve. The monopolist faces a downward-sloping demand curve means that the monopolist is a price-setter, not a price-taker. Its price-setting powers are limited however (it can not charge "any price it wants"), because lower prices are required if larger quantities are to be sold. As a consequence, the monopolist must determine simultaneously both its rate of output and its price.

Dominant and tight oligopoly is generally characterized by a number of relatively small producers; barriers to entry are weak compare to monopoly; product differentiation is present; and people have incomplete information. Product differentiation and the absence of complete information are the important sources of the monopoly power of the dominant as well as oligopolistic firms possess in this market structure. But the significant distinguishing feature of oligopoly is the fewness of firms, which gives rise to recognized mutual interdependence, a feature that complicates considerably the study of this particular market structure.

Firms producing under conditions of monopolistic competition face downward-sloping demand curves for their products. Each firm faces a demand curve that is much more elastic than the demand curve for the industry's output. The reason is the availability of many close substitute products within the industry. Ease of entry implies the absence of economic profits under monopolistic competition in the long run. However, because each firm faces a downward-sloping demand curve for its product, the long-run equilibrium will be characterized by "wastes of competition."

Advertising is an important and controversial form of nonprice competition. Its purposes are threefold:

- (a) to expand the demand for the firm's product;
- (b) to maintain demand in the face of the promotional efforts of rival firms; and
- (c) to reduce the price elasticity of demand.

2. Market structure by branded or generic drug share.

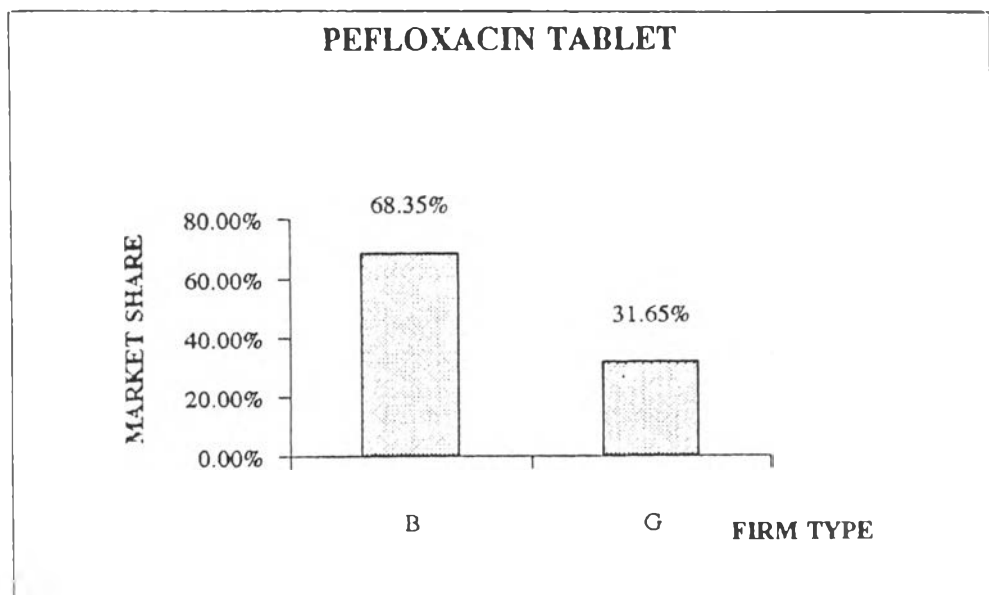
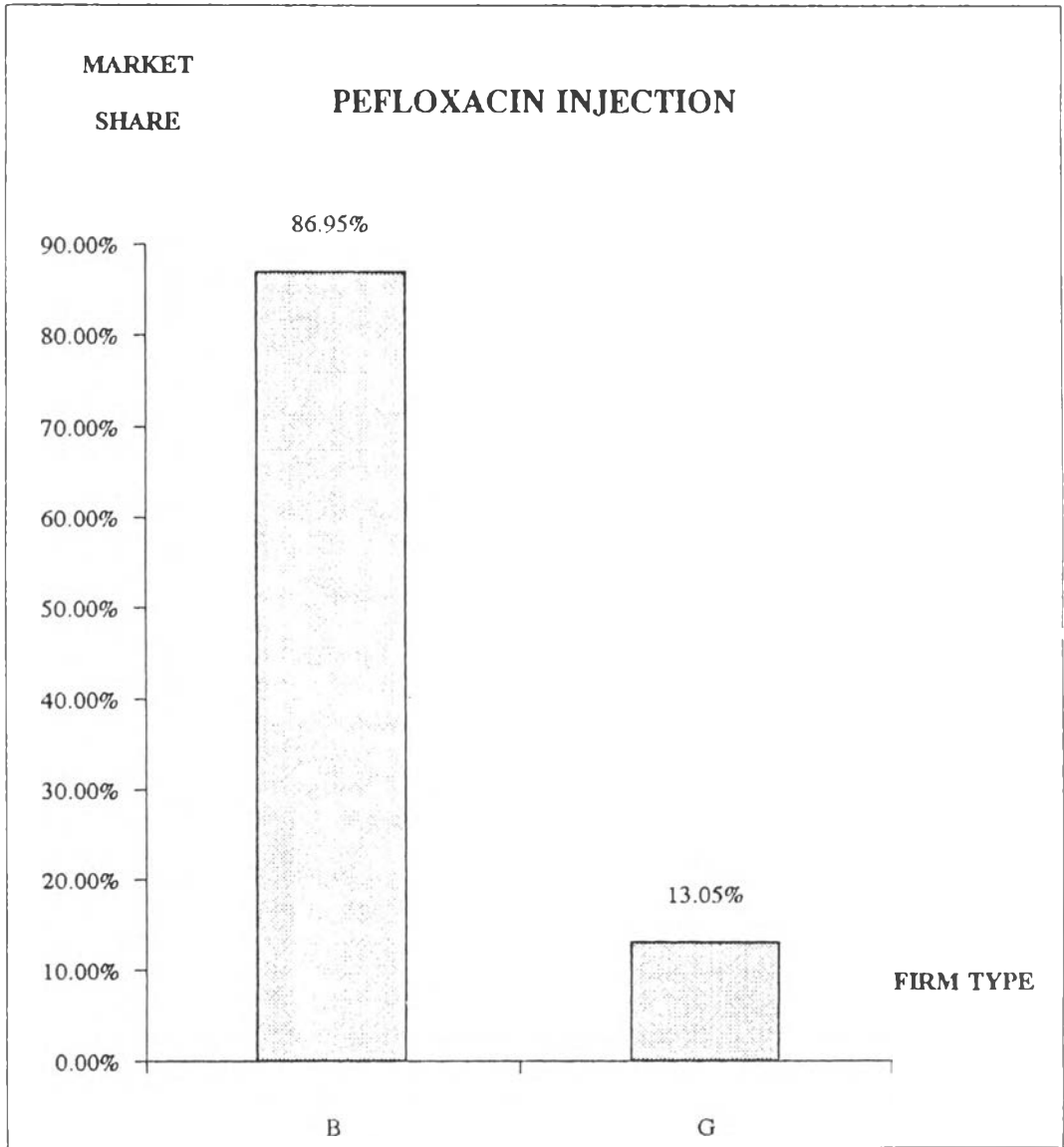
Assuming that in each antibiotic drugs, the branded drugs and the generic drugs are in the different market. The market structure of branded drugs share and generic drugs share is studied. The result is shown in Table 3.2

Table 3.1: Leaders' Market Share and Four Firm Concentration Ratio of Sample Antibiotic Drugs, 1993

	Number of Firm	Leader Market Share	Four Firm Concentration Ratio	Market Type
azteonam injection	1	100.00 %	-	Pure Monopoly
thiamphenicol injection	1	100.00 %	-	Pure Monopoly
cefsulodin injection	1	100.00 %	-	Pure Monopoly
spiramycin injection	1	100.00 %	-	Pure Monopoly
pefloxacin injection	2	86.95 %	-	Dominant Firm
pefloxacin tablet	2	68.35 %	-	Dominant Firm
cloxacillin capsule	32	-	53.39 %	Tight Oligopoly
tetracycline capsule	68	-	71.50 %	Tight Oligopoly
cephalexin capsule	10	-	86.90 %	Tight Oligopoly
amikacin injection	11	-	78.12 %	Tight Oligopoly

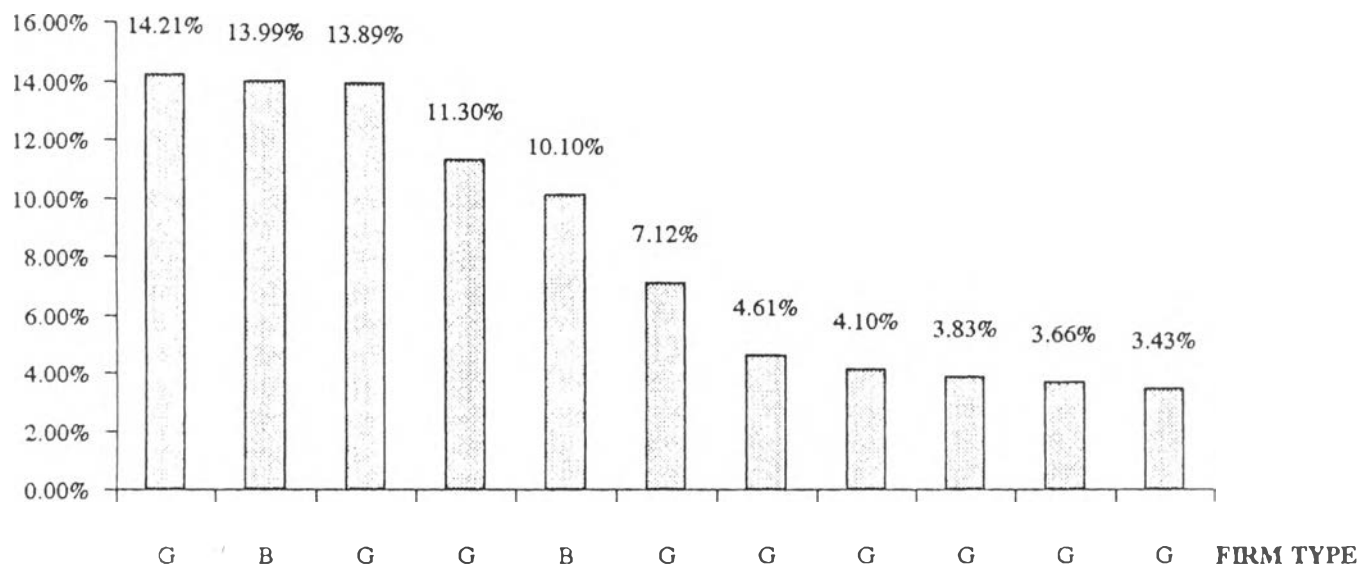
Source: Calculate from the profile of FDA and IMS

Figure 3.1: Market Share of Sample Antibiotic Drugs in Dominant Firm and Tight Oligopoly Market, 1993



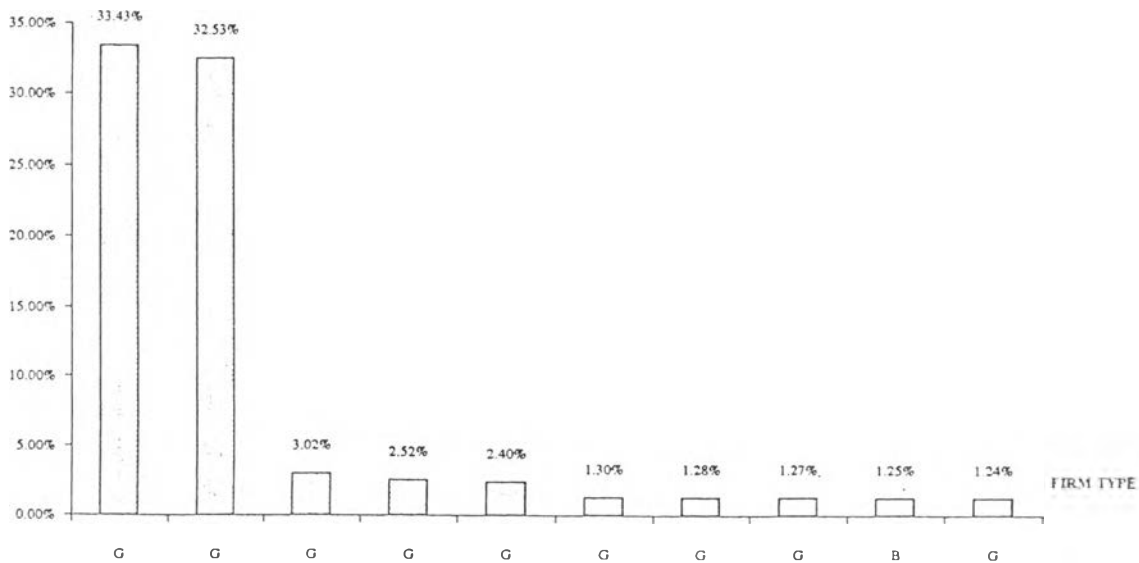
CLOXACILLIN CAPSULE

MARKET SHARE



MARKET SHARE

TETRACYCLINE CAPSULE



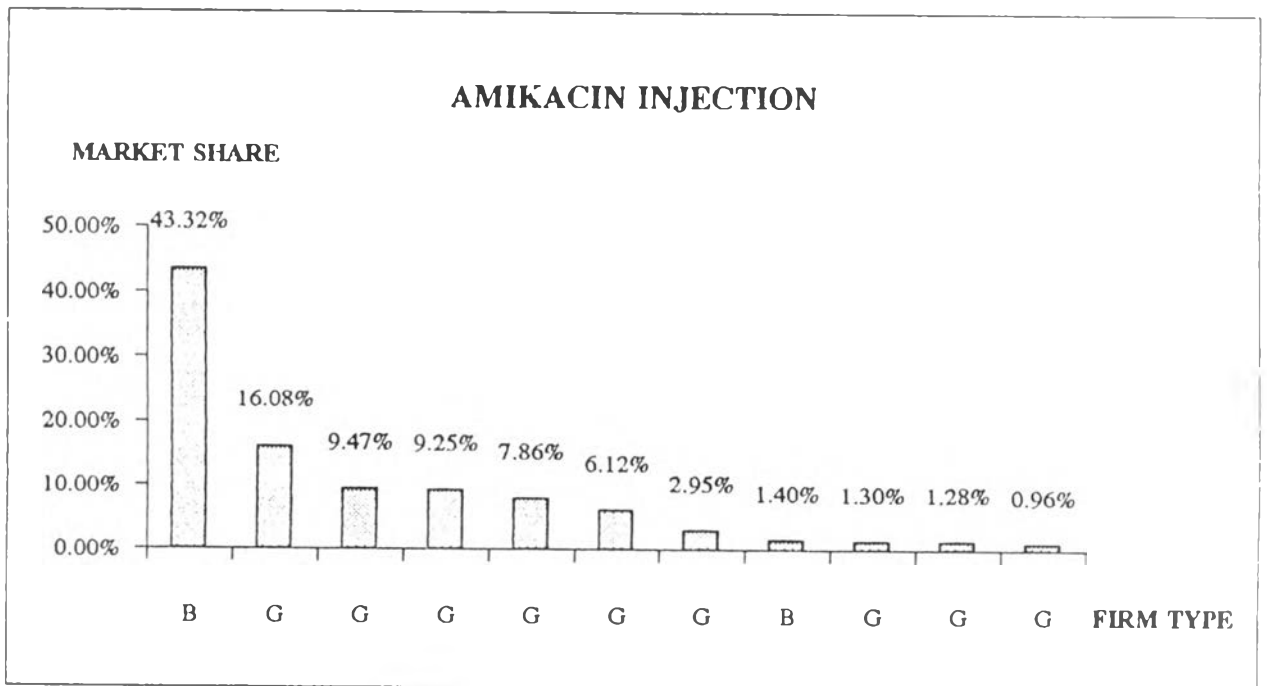
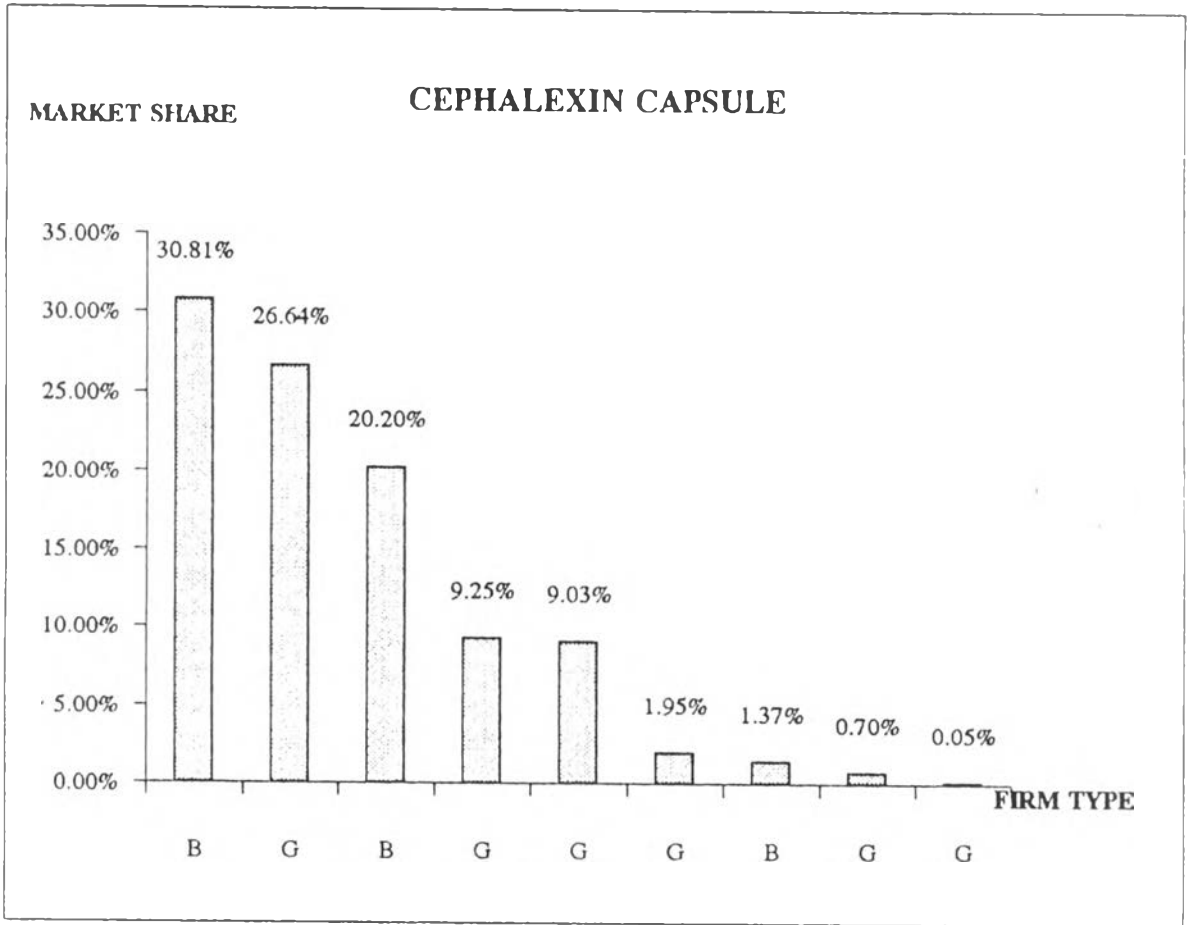


Table 3.2: Total Sampled Antibiotic Drug Market Value, Classified to Branded and Generic Drug Share, 1990-1993

Year	Total Market		Branded Market		Generic Market		Branded Share (%)	Generic Share (%)
	Value (m baht)	Growth (%)	Value (m baht)	Growth (%)	Value (m baht)	Growth (%)		
AZTEONAM INJECTION								
1990	4.4		4.4				100	
1991	7.35	67.05	7.35	67.05			100	
1992*	6.01	-18.23	6.01	-18.23			100	
1993	6.84	13.81	6.84	13.81			100	
THIAMPHENICOL INJECTION								
1990	3.72				3.72			100
1991	1.23	-0.67			1.23	-0.67		100
1992*	1.03	-0.16			1.03	-0.16		100
1993	0.17	-0.83			0.17	-0.83		100
CEFSULODIN INJECTION								
1990	3.36				3.36			100
1991	1.67	-0.50			1.67	-0.50		100
1992*	0.76	-0.54			0.76	-0.54		100
1993	1.57	1.07			1.57	1.07		100
SPIRAMYCIN INJECTION								
1990	0.87		0.87					100
1991	1.78	1.05	1.78	1.05				100
1992*	1.59	-0.11	1.59	-0.11				100
1993	2.98	0.87	2.98	0.87				100
PEFLOXACIN INJECTION								
1990	13.74		11.36		2.38		82.68	17.32
1991	4.13	-69.94	3.79	-66.64	0.34	-85.71	91.77	8.23
1992*	8.49	105.57	8.19	116.09	0.3	-11.76	96.47	3.53
1993	34.86	9.96	21.61	1.49	196.67	86.99	13.01	86.99
PEFLOXACIN TABLET								
1990	5.47		4.76		0.71		87.02	12.98
1991	1.86	-65.99	1.78	-62.6	0.08	-88.73	95.7	4.3
1992*	4.6	147.31	3.89	118.54	0.71	787.5	84.57	15.43
1993	6.51	41.52	4.45	14.39	2.06	190.14	68.36	31.64

Note: 1. * This is due to the introduction of VAT at the beginning of 1992.

2. Thiamphenicol injection was banned. Therefore, only the generic drug firm that has produced.

Source: Calculated from the profile of FDA and IMS.

Table 3.2 cont.: Total Sampled Antibiotic Drug Market Value, Classified to Branded and Generic Drug Share, 1990-1993

Year	Total Market		Branded Market		Generic Market		Branded Share (%)	Generic Share (%)
	Value (m baht)	Growth (%)	Value (m baht)	Growth (%)	Value (m baht)	Growth (%)		
CLOXACILLIN CAPSULE								
1990	89.15		24.91		64.24		27.94	72.06
1991	103.95	16.6	26.83	7.71	77.12	20.05	25.81	74.19
1992*	102.49	-1.4	23.25	-13.34	79.24	2.75	22.68	77.32
1993	101.31	-1.15	22.8	-1.93	78.51	-0.92	22.5	77.5
TETRACYCLINE CAPSULE								
1990	120.78		6.19		114.59		5.12	94.88
1991	134.38	11.26	6.66	7.59	127.72	11.46	4.96	95.04
1992*	150.75	12.18	5.58	-16.22	145.17	13.67	3.7	96.3
1993	126.02	-16.4	2.11	-62.19	123.91	-14.64	1.67	98.33
CEPHALEXIN CAPSULE								
1990	27.68		12.59		15.09		45.48	54.52
1991	30.57	10.44	15.26	21.21	15.31	1.46	49.92	50.08
1992*	34.57	13.08	15.25	-0.06	19.32	26.19	44.11	55.89
1993	33.96	-1.76	19.01	24.65	14.95	-22.62	55.98	44.02
AMIKACIN INJECTION								
1990	42.29		21.42		20.87		50.65	49.35
1991	55.38	30.95	29.7	38.65	25.67	22.99	53.63	46.37
1992*	61.55	11.14	34.09	14.78	27.46	6.97	55.38	44.62
1993	91.64	48.89	40.99	20.24	50.65	84.45	44.73	55.27

Note: *This due to the introduction of VAT at the end of 1991.

Source: Calculated from the profile of FDA and IMS.

Competition in Antibiotic Drugs.

Considering in the tight oligopolistic market type as cloxacillin, the market can be lost very quickly. Table 3.3 shows that between 1990 and 1993 cloxacillin capsule 250 mg which performed the oligopolistic behavior ranking by output value.

Table 3.3 : Leading Ten Firms, Cloxacillin Capsule Market : Share in Total Market and Ranking

Company	Type	Market Share (%)		Rank	
		1990	1993	1990	1993
Olic (Thai) Co.(orbenin)	B	27.16	13.99	1	2
Thai Meiji Pharm.	G	15.96	11.30	2	4
Unison Drug Lab.	G	9.37	13.90	3	3
Siam Bhaesaj Co.	G	0.98	4.61	4	7
Sahapat Bhaesaj	G	7.41	7.12	5	6
Pond Chemical	G	5.64	0.87	6	19
Olic(Thai)Co.(serviclox)	G	4.53	10.10	7	5
Modern Manu.	G	4.00	0.79	8	21
Continental Pharm.	G	3.53	3.43	9	11
General Drug House	G	2.67	2.15	10	12
Nida Pharma	G	5.10	14.21	11	1

Source : Calculate from the profile of FDA and IMF

An event that Olic (Orbenin) suffered a market share decline (27.16 percent in 1990 to 13.99 percent in 1993). This might be one of the reason why Olic produce another generic products in the name of serviclox to make more product differentiation in the market. The top four held in 1990 , 61.47 percent and 53.39 percent in 1993. In the generic drug

industry which generally used especially in generic antibiotic drugs . The “top is a very slippery place”. Moreover , not only did the 1990 leaders lose market share , the corresponding 1993 leaders held a small share in the market than their counterparts did in 1990 (The four - firm concentration ratios were declined).

The reason for this volatility in market share may be from the highly innovative in the drug industry . It is continually introducing new products , and if any firms wish to hold its place, it must also do so. In this sense, however , these figures may be misleading. Firms compete with each other not within the total pharmaceutical market but rather within therapeutic submarkets whereas cross - elasticity of demand is low. Within these submarkets substitutability of one product for another exists.

Pricing Activity and Firms' Pricing Policy.

Is there price flexibility overtime ? Do competitive forces tend to press down high initial prices? Are low prices met with competing price cuts as existing firms strive to maintain market position in the face of entry? The evidence is presented in Table 3.4 for Cloxacillin Capsule Market .

Table 3.4: Cloxacillin Capsule Market Price Statistics, 1990-1993

Year	1990	1991	1992	1993
Mean(Baht/1000 cap.)	1,670.00	1,606.21	1,596.08	1,602.92
Mode(Baht/1000 cap.)	1,700.00	1,800.00	1,869.15	1,869.15
Median(Baht/1000 cap.)	1,600.00	1,600.00	1,588.78	1,588.78
Maximum(Baht/1000 cap.)	3,000.00	3,000.00	2,805.00	2,805.00
Minimum(Baht/1000 cap.)	1,000.00	900.00	900.00	900.00
Max / Min (%)	300.00	333.33	311.67	311.67
Max / Mean (%)	179.64	186.77	178.77	174.99
Max / Mode (%)	176.47	166.67	150.07	150.07
Standard deviation	432.35	435.27	430.85	410.79
Number of observation	29.00	29.00	33.00	31.00

Source: Calculate from the Profile of IMS

There is price discrepancy among cloxacillin capsule shown in year 1990 to 1993. It might be said that dispersion in pricing due to heterogeneity in cloxacillin capsule.

Firstly, the information about pricing policy among each sample antibiotic drugs could be got from the quantitative survey. Unfortunately, the response rate is very low so the data cannot be interpreted. Therefore, this section describes the overall pricing policy of drugs which has been collected from the in-depth interview.

The drug market comprises a segment group of users which can be groups of patients of similar age group, types of diseases, types of buyers

such as :

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Patient → GP (prescription) → Pharmacist → Patient
Patient → Hospital doctor → Pharmacist → Nurse → Patient
Factory → Wholesaler → Pharmacist → Patient

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All of target groups have different needs. Then the pricing and the promotion should be different so as to make the product differentiate and meet the needs of target groups.

1. Pricing Determination.

There are four basic approaches for pricing to be considered:

- * Cost-based pricing.
- * Market demand-based pricing
- * Competition-based pricing.
- * Market-based pricing.

Cost-based pricing (accountants' approach).

This is the approach similar to the way an accountant would calculate the price for a product. It is based on total cost of product, including production and marketing costs, plus an allocation for overheads plus the target percentage to provide a profit margin. The total resulted to a selling price.

Problems involved are :

- * It ignores market factors such as demand and competitors' actions.
- * Cost calculation is based on a predetermined level of demand and production. As these fluctuate, so does the product cost.
- * Overhead cost allocation can lead to a wrong pricing decision.

A major benefit of this approach is that it can help to indicate minimum price levels.

Market demand-based pricing (economists' approach).

The aim of this approach is to explore the effect that different prices may have on the demand in the market for a product. The break-even point (produced by varying volume forecasts) is calculated based on different selling prices. This approach focus on the impact of price on volume and tries to find the most profitable price/volume ratio.

The advantages of the market demand approach is that it brings together price calculations with market demand realities; that is, if demand

for a product tends to be a function of its price, then this should be a determining factor in the decision.

The disadvantage is the difficulty of estimation the effect that price variations may have on product demand: one has to estimate how much one can sell in units for a given price level. Given this problem, an easy way to establish price elasticity is to examine the historical performance of similar products at a number of different price levels to study the effect on sales of price.

Competition-based pricing.

The objective of this pricing approach is that it considers the prices set by competitors in the market place. Competitive pricing can be approached in a number of ways;

- * Prices can be set above the competitors' products.
- * Prices can be set below the competitors' products.
- * Prices can be set at the same level as those of the competitors' prices.

The estimation of competitors' costs is considered, then develop the pricing strategy. In this way, how much price latitude the competitors enjoy was estimated and the competitive price can be set.

Market-based pricing.

In this approach prices are based upon the 'value satisfaction' the product delivers to the buyer of the 'perceived' value. This 'perceived' value can be a result of;

- * Value for money influenced by reputation of the firm, service level, performance of the product (durability, ease of use, etc.).
- * Image affected by status (endorsement by opinion leaders, exclusivity or promotion).
- * Reflection of different and distinctive market segment putting different 'value' on a product performance.
- * Price barriers set in different segments such as National Health hospitals and private clinics.

The key to market pricing is to make an accurate assessment of a market's perception of the value of our product.

2. Pricing Strategies.

Price leadership.

Decision-makers often tend to think of price ranges for products rather than absolute price level. The favorable image of the product comparing to the competitor's, one is distinguished as a guideline to develop price. This 'valued' or favorable image must be reflected in and equivalent pricing policy. (Remember, to maintain this price we must keep reinforcing this image.)

Given a price range, a decision has to be made as to where in that range to locate the product's price. This is a strategic decision made on the basis of corporate and company objectives, which may include some or all of the following:

- * Achieve the target of return on investment or sales.
- * Stabilize prices.
- * Maintain or improve market share.
- * Meet or prevent competition.
- * Maximize profits.

There are a few important pricing strategies (skimming, penetration, marginal cost) as follows:

Skimming price policy.

This strategy sets a price at the top of the acceptable price range. Skimming is often used:

- * On a new product in an early stage of the life-cycle to recoup high R&D. investment.
- * To prevent pricing mistakes by being too low (it is easier to reduce than to increase prices if the wrong price level is chosen).

Advantages of this policy are :

- * Used on a new product in early stage of life-cycle to recoup high R&D investment.
- * To segment the market.

- * To prevent pricing mistakes by being too low- it is easier to reduce than to increase prices if wrong price level chosen.
- * To limit off-take if plant capacity or stocks not adequate.

Disadvantages of the above policy are :

- * Attracts competition.
- * Product cost higher due to small product value.
- * Consumer awareness and acceptance will be slower in the introductory product life stage for a new product.
- * More vulnerable to economic depression.

Penetration price policy.

This strategy is the opposite of skimming. A low price is set, often below existing range with the objective to gain maximum market penetration as quickly as possible, that is, low price, high volume.

Advantages of this policy are :

- * Product economy of large-scale production.
- * Pre-empts competition.
- * Wins wide product allegiance for future, for example, after patent life.

Disadvantages of the above policy are :

- * Profit return is low and long pay-back period for a new product.
- * It will be disastrous if the product has a very short life-cycle.

- * It can be difficult to overcome the psychological disadvantages of having to increase price if the initial price was set too low.

Marginal cost pricing.

In highly competitive situations one may have the opportunity of gaining business if a sufficiently low price is offered. This is especially true in hospital tendering. The question arises, however: what is the lowest price to use at which it makes sense to take the business? One approach is to use marginal costing which is defined as 'the cost of producing one more unit.

The cost of producing one more unit means that the fixed costs are already being covered by the existing sales volume, and then the costs of producing the extra unit are the variable costs. It can be argued that, even at no profit, marginal business is worth having as it may use resources that would otherwise stand idle. Generating this type of business, however, will ultimately eat into profits and depress the percentage of return on sales.

The major use of marginal costing, therefore, is to answer the question 'Should one accept this order?' rather than as a pricing tool. This type of strategy is more often used with price elastic, high-volume products, where it is important to keep the sales volume up, as in the venipuncture market.

3. Price Discrimination.

Price Discrimination can be defined as the practice of selling the same kind of product for service at different prices to different purchasers, or the practice of selling products at a price disproportionate to the marginal costs of the product sold. Moreover, even in the absence of a price differential,

price discrimination may occur if two buyers of the same kind of drug are charged an identical price by a single seller, although the seller has different production, selling, or transportation costs in serving them.

In Thailand, drug suppliers will sell the same kind of drugs at different prices to different groups of customers such as private hospitals, government hospitals, drugstores and clinics. Also, different customers in each group are charged with different prices. This depends on the bargaining power and an amount of benefit a hospital wants from the firm in buying its drugs. Most firms try to attract their customers by giving a discount (at different percentage) or some gifts (i.e. refrigerators, air-conditioners, televisions, and so on) to the customers that purchase in bulk. In this case, the seller will bear different costs if it charges different customers with the same price for the same drug. Normally, regular customers will be charged with lower prices.

In general, government hospitals will be charged with higher prices than private ones since they have a lower value of price elasticity of demand for drugs. To illustrate, there are various drugs to cure a disease. While public hospitals can use the government budget to buy only drugs in the National Essential Drug List (NLED), private hospitals can have more choices of drugs for consideration. Therefore, in private hospitals the substitution between each drug for a certain disease is more likely than in public hospitals. Another reason is that essential drugs purchased by public hospitals must have standard quoted prices, which are often higher than market prices.

Accordingly, a firm can sell a drug to public hospitals at a standard quoted price and must give part of the profit to support the activities of public

hospitals and the purchasing authorities. But in selling the same drugs to private hospitals, the firm can sell at the market price of the bargaining price, since the private hospitals usually try to minimize their cost so they want to buy at lowest possible price. Besides, a medical university's hospital can buy drugs, especially original drugs, at the lowest price, since the firm is willing to reduce its prices in order to push its drugs into the hospital's drug list and make the medical students be familiar with its tradename and develop a tradename-prescription behavior. However, the firms which believe in the tradename influence are the MNCs, which sell original drugs.

4. Price Competition.

There are many forms of price competition used by drug suppliers. The first is a discount rate given to customers, which varies in percentage and methods. Generally, a firm will give a cash discount of 2-5 per cent of the total purchase value and another 5-60 per cent discount, e.g. plus and amount of sample drugs, as a bonus to the customer rather than directly reduce the price. The extent of the discount depends on the following factors :

- a. types of suppliers, i.e., local firms will give more percentage of discount than the MNCs,
- b. the number of competitors, i.e. it is not necessary for a drug produced by one or a few producers to give high percentage of discount to attract their customers, and

c. the bargaining power of the customers, i.e. hospitals which purchase drugs in great volume can bargain for a high percentage of discount or more gifts than those which have small purchase volumes.

Another method is a long-term credit. A firm that offers a long-term credit to its customers usually has a larger capital fund to support this activity than other firms.

5. Non-price Activities.

Drug suppliers in Thailand normally do not use a price competition practice as a main market strategy, instead, they use non-price competition. However, the firms that are involved in price and non-price competition have different characteristics. Most of the firms that practice price competition are local firms that produce unpopular tradename drugs and these drugs can be easily substituted by drugs from other firms.

Thus, the firms will reduce their drug prices in competition with others and in a bid to sell their drugs to the GPO. But the drugs of the firms that practice non-price competition, are popular on the market and they can command their drug prices. In addition, they can distribute their drugs directly to the consumers through drugstores. Thus, it is not necessary for them to lower their drug prices to compete with other firms in bidding at the GPO.

The firms in the oligopolistic market will use non-price competition in order to promote their sale, to create new market, to change consumers' taste and to differentiate their drugs (to increase the chance of marketing price discrimination). Regarding a firm in the oligopolistic market which has

higher price inelasticity of demand for its drugs. The reduction of its prices does not make its total revenue increase. Therefore, it will differentiate its drugs by adding some other active ingredients or changing designs of package in order to increase or maintain its market share or produce both branded drugs and several generic drugs with brand name.