Limit Pricing, Bain's Theory, Assumption, Models of Limit Price Theory, Area of Certainty & Uncertainty

Introduction:

We have studied that the concept of barriers to entry is a characteristics of imperfect competition. Bain's theory deals with barriers to entry. There are different sources of barriers to entry. Bain's theory talks about limit pricing, which is a part of artificial source of barriers to entry. Before we understand Bain's theory, we need to understand the concept of limit pricing. We should keep in mind that barriers to entry create monopoly power in the market, which reduces consumers' surplus and raises producers' surplus. It means that barriers to entry can lead to inefficiency in the market due to monopoly because monopoly has its own evils.

Bain launched the literature on limit pricing. He was the first to formalize an incumbent's decision to cut its prices to decrease the probability of entry. Friedman observed that low prices had a limited commitment value since a credible threat to cut prices upon entry may deter entry as effectively, and more profitably, than a price cut prior to entry.

Example:

Consider the following example.

An incumbent company fearing entry installs extra machinery. A potential entrant knows that the company will have a lower variable cost in the future. The low cost implies that the incumbent would set a lower price if entry occurs than if the incumbent did not have the extra machinery. As a consequence of the incumbent's extra capacity and lower cost, the potential entrant would

receive a lower price. Under the right conditions, the entrant's price would be too low to cover all of its costs, so it would choose not to enter. Thus the incumbent's decision to install the extra machinery prevents entry. Further, as a result of having the extra capacity, the incumbent sets a lower price today, even though entry has not and will not occur. Potential competition has disciplined the price. If there were no possibility of entry, the incumbent would not choose the extra capacity, would have a higher level of cost, and would set a higher price. The possibility of entry limits the price that the incumbent will charge, which is why the phenomenon is called limit pricing.

Limit Pricing:

A limit price (or limit pricing) is a price, or pricing strategy, where products are sold by a supplier at a price lower than the average cost of production or at a price low enough to make it unprofitable for other players to enter the market.

It is used by monopolists to discourage entry into a market, and is illegal in many countries. The quantity produced by the incumbent firm to act as a deterrent to entry is usually larger than would be optimal for a monopolist, but might still produce higher economic profits than would be earned under perfect competition. In other words, limit pricing suggests that an incumbent firm may be able to make it unprofitable for a potential entrant to enter the industry. The argument is that the incumbent firm can produce a certain output before entry, and threaten to continue producing that output even if entry occurs. If the potential entrant believes the claim, he will decide it is unprofitable to enter.

Bain's Theory:

Bain formulated his limit-price theory in an article published in 1949, several years before his major work Barriers to New Competition, which was published in 1956.

Definition:

"A barrier to entry is an advantage of established sellers in an industry over potential entrant sellers, which is reflected in the extent to which established sellers can persistently raise their prices above competitive levels without attracting new firms to enter the industry."

The basic idea of this theory is that why firm charges a price before the short term maximizing profit equilibrium price. Traditional theory of barriers to entry focuses only on new entrants of the market. Traditional approach does not deal with potential entry. This results in normal profit in the long run. According to traditional approach the equilibrium occurs when price and Long run Cost (LAC) are equal. This is perfectly competitive price. Bain argued that price did not decrease to LAC in the long run because of the existence of barriers to entry. He also argued that price was not set at the level compatible with profit maximization because of the threat of potential entry. **It means that, according to Bain, price sets above perfectly competitive price and below monopoly price.** This behaviour can be explained by assuming that there are barriers to entry, and that the existing firms do not set the monopoly price but the 'limit price', that is, the highest price which the established firms believe they can charge without inducing entry.

Example:

The example below explains limit-pricing theory.

We assume that market demand function is as follows:

P = 100 - Q(1)

There is one incumbent firm in the industry, and its output is by Q_I . There is a potential entrant to this industry and its output is Q_E . Both firms have the same costs of production.

The total cost function is:

TC = 400 + 10Q(2)

And therefore

MC = 10(3)

AC = (400/Q) + 10(4)

The incumbent firm knows that there is a potential entrant, and believes that the potential entrant believes that the incumbent will not change its output even if the potential entrant decides to enter. The incumbent firm therefore wants to choose Q_I so that entry will be unprofitable. In fact, the incumbent knows that the potential entrant will not enter unless it earns a positive profit ($\prod_E > 0$), so the incumbent will choose Q_I to make the entrant's profit equal to zero. This will happen if the residual demand curve of the potential entrant just touches (is tangent to) its AC curve but does not rise above it anywhere.

To find the tangency point, we differentiate average cost function with respect to quantity.

Therefore,

 $dAC/dQ = -400Q^{-2}$ (5)

The slope of the residual demand curve is:

Equating equation (4) and (5),

 $-400Q^{-2} = -1$

 $=>400 = Q^2$

 $\Rightarrow 20 = Q$ (7)

When Q = 20

AC = (400/20) + 10 = 30(8)

This means that the residual demand curve must pass through the point Q =20, P = Rs. 30 and have a slope of -1. The general equation for this residual demand curve will be P = a - Q_E (where a is the vertical intercept), and at the point of tangency, this equation will satisfy 30 = a - 20. Therefore, a = 50, and the residual demand curve which just touches the AC curve will have the equation, P = 50 - Q.

The market demand curve for potential entrant is:

 $\mathbf{P} = \mathbf{100} \cdot \mathbf{Q}_{\mathrm{I}} - \mathbf{Q}_{\mathrm{E}}$

To leave the appropriate residual demand curve Q_I must equal to 50. The calculation of best output is as follows:

 $P = 50 - Q_E$ (9)

Therefore,

Therefore,

 $MR_E = 50 - 2Q_E$ (11)

Setting this equal to MC, we have

 $50 - 2Q_E = 10....(12)$

Therefore,

Therefore,

 $P_E = 50 - 20 = Rs. 30$ (14)

At this price and quantity, profit for the entrant is:

Given this calculation, the potential entrant would decide not to enter. The price of Rs. 30 is called the "limit price" because the incumbent firm, by threatening to produce 50 units of output after entry occurs, is threatening to drive the price down to Rs. 30 after entry.

It means that incumbent firm sets the price in such a manner that the profit of the potential entrant will become zero in the market if he enters and hence there is no potential entry in the market. This price is known as limit price.

Before we understand the model of Bain's theory, we need to understand the assumptions of the model.

Assumptions:

The assumptions of Bain's theory are as follows:

- (1) There is a determinate long-run demand curve for industry output, which is unaffected by price adjustments of sellers or by entry. Hence the market marginal revenue curve is determinate. The long-run industry-demand curve shows the expected sales at different prices maintained over long periods.
- (2) There is **effective collusion** among the established oligopolists. It means that collusion will lead to higher gain.
- (3) The established firms can compute a limit price, below which entry will not occur. the computation of limit price depends on:
 - (a) On the estimation of costs of the potential entrant
 - (b) On the market elasticity of demand
 - (c) On the shape and level of the Long term average cost
 - (d) On the size of the market
 - (e) On the number of firms in the industry

- (4) Above the limit price, entry is attracted and there is considerable uncertainty concerning the sales of the established firms.
- (5) The established firms seek the maximization of their own long-run profit.

Model:

There are two models of limit price theory. The flow chart shows the two models:



Now we study these two models in detail.

Model 1: No Collusion with the New Entrant

This model can be explained by figure-1:

In this figure quantity is measured on X-axis and cost and revenue is measured on Y-axis.

- (1) The Average Revenue (AR) curve shows the demand curve for a firm. MR is the marginal revenue curve in the figure. AR and MR both are downward slopping curve that shows the inverse relationship between quantity and MR and AR both.
- (2) In case of perfect competition, equilibrium occurs at point B. at this point at this point a verage revenue and long run average cost are equal. The equilibrium price will be P_C and equilibrium output will be Q_C . Here, Price, long run marginal cost and long run average cost are equal. Therefore, firm cannot enjoy abnormal profit in the market.





- (3) In case of monopoly, equilibrium point is F. At this point marginal revenue and long run marginal cost are equal. The equilibrium price will be P_m and equilibrium outcome will be Q_m. Here P_m is greater than the marginal cost and hence firm earns the profit of P_cP_mAF.
- (4) Now we assume that limit price is correctly calculated and determines at P_L . At this price equilibrium output is Q_L , we can easily see that limit price P_L is lower than that of monopoly price P_M and higher than that of price in perfect competition. Therefore, $P_C < P_L < P_M$ in this case profit of the firm is P_LCHP_C . This is lower than that of monopoly profit of P_cP_mAF . Another point is that the profit of the firm at P_L is higher than the perfect competition.

Area of Certainty and Uncertainty:

Monopoly makes larger amount of profits due to market power. Higher profits attract new firms in the market. If firms enter in the market, monopolist will lose the market power, which leads to competition and lower amount of profit. If a monopolist charges a price above limit price and below monopoly price, there is a risk of new entrant. Because in this case the behavior of the new entrant is not known. This region is known as uncertain region. In figure 1, left of C is uncertain demand curve. The right of C is the area of certainty. The behavior of the new entrant is known to the monopolist.

Summary:

We have studied that barriers to entry is a characteristic of an imperfect market. These barriers lead to monopoly and higher prices in the long run which in turn reduces the consumers' surplus and increases the producers' surplus. Bain's theory deals with limit price. A limit price (or limit pricing) is a price, or pricing strategy, where products are sold by a supplier at a price lower than the average cost of production or at a price low enough to make it unprofitable for other players to enter the market. It means that incumbent firm sets the price in such a manner that the profit of the potential entrant will become zero in the market if he enters and hence there is no potential entry in the market. This price is known as limit price.