How Price is Influenced by Market Structure

1. Introduction: Market Structure

A. Four Types: Industries could fall into four major types of market structure

- Perfect Competition
- Pure Monopoly
- Monopolistic Competition
- Oligopoly

B. General Criteria for Classification of Firms into Different Market Structure:

- Number of firms or the size of the firm relative to the market
- The existence or lack of product differentiation
- The existence or lack of barriers to entry

In studying the market structure of an industry the focus is on understanding the *ability or the power of a single firm to set its own price—monopoly power*. A summary of the relationship between the type of market structure and individual firm's ability to set price is presented using the table below:

Type	# Firms	P. Differentiation	E. Barriers	Monopoly Power
1. Perfect Competition	Many (Small)	Homogenous P.	None	None (price taker)
2. Monopolisitc Competition	Many (Small)	Differentiated P.	None	Some (price maker)
3. Oligopoloy	Few (Large)	Both Homogenous & Differentiated	Substantial	Considerable (price maker)
4. Pure	One	Homogenous	Complete	Absolute (Price maker)

2. The Determinants of the Revenue Function of a Firm that is a Price Maker

As we observed in our earlier discussion, the revenue function of a perfectly competitive firm (i.e., a price taker) is affected solely by the quantity of the output that the firm is able to produce at a given point in time. Functionally, this can be represented as,

$$\textbf{TR} = \textbf{\textit{f}(p}_e\textbf{, q)}, \text{ where } p_e \text{ is the given market price.}$$

Thus,

$$\textbf{TR} = \textbf{p}_e \cdot \textbf{q}$$

On the other hand, when a firm has a monopoly power (i.e., price maker), the revenue function of a firm is affected both by prices and outputs. Functionally, this can be represented as,

$$\textbf{TR} = \textbf{\textit{f}(p, q)}.$$

This opportunity to set price confronts a firm with the following interesting dilemma.

- In one respect, unlike a perfectly competitive firm, a firm with a monopoly power, can raise the price of its product and still be able to find some buyer for its product. As shown below, a firm can increase its price from p_o to p_1 and still be able to sell q_1 amount of output.
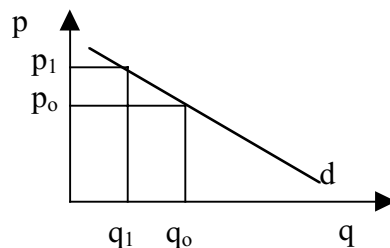
- On the other hand, a firm can not raise its price without losing some customers (decline in the quantity sold). As shown above, increasing price from p_o to p_1 will cause quantity sold to decrease from q_o to q_1. This is because *the firm is facing a negatively demand curve*.

- Thus, since a change in price causes an opposite change in quantity, a firm can not be completely certain about the effect of increasing a price on total revenue.

3. The Relationship of Price Changes and The Revenue of the Firm:

We studied earlier that the relationship of price changes and total revenue can be described by the following formula:

dTR/dP = q{1 - |ε$_p$|}, where ε$_p$ is elasticity of price.

Thus,

- If $|ε_p| > 1$; i.e., *elastic*, total revenue and price are inversely related. Hence, increasing prices will decrease total revenue.
- If $|ε_p| < 1$; i.e., *inelastic*, total revenue and price are directly related. Hence, increasing prices will increase total revenue.

Thus*, if a firm is operating in the elastic portion of its demand curve, it can not increase its prices without the risk of reducing its revenue*. Ironically, as we will see next, a firm with a monopoly power can only operate only in the portion of its demand curve that is elastic.

4. **Why firms' with monopoly power cannot raise price without adversely affecting their revenue**

To show this systematically, we need to explore the relationship between marginal revenue and elasticity of the firm.

$$TR = f(p, q),$$

and by definition, marginal revenue is,

$$dTR/dq = d\{f(p, q)\}/dq = d(p.q)/dq$$

$$dTR/dq = p(d/dq)q + q (d/dq)p$$

$$= p(1) + q(dp/dq)$$

$$= p + q/p(dp/dq)p$$

dTR/dq = p(1 + 1/ε$_p$)
= p {1 - |1/ε$_p$|}

Note here, according to the above formula, marginal revenue is negative when the demand facing a firm is *inelastic*(less than 1). Hence, a firm will not operate in this

portion of its demand curve. The relationship of price, marginal revenue and price elasticity can be further demonstrated graphically as shown below.

$$MR = p \: \{1 - |1/\varepsilon_p|\}$$