

LecH2,2 introduction
on campus

→ Lecture #02,03 (online)

27/03/2023

→ Industrial Economics

(Book Jean Tirole)

: Industrial Organization:-

Theory of Industrial organization

Industrial Organization is a branch of microeconomics that studies how firms & industries behave & interact with each other in markets. It examines the behavior of firms with respect to competition, market power, strategic decision-making, entry & exit barriers, price strategies, and other aspects related to industrial structure & conduct.

- Industrial organization examines the market structure and how it influences the behavior of firms and the outcomes for consumers.
- The market structure can vary from perfect competition to monopoly, and there are various market structures in between like oligopoly & monopolistic competition.
- Also the role of government policy.
- The goal of industrial organization is to provide insights into how firms compete, how markets work & how public policy can be used to promote competition & enhance social welfare.

First wave & Second wave of Industrial organization

1) First wave

2) Second wave.

1) First Wave:- Two waves of interest for industrial organization to become one of the main fields of economics.

- The first wave associated with names of Joe Bain & Edward Mason and sometimes called "the Harvard tradition," was empirical in nature.

→ developed famous "Structure- Conduct- Performance" paradigm, according to market Structure (the number of sellers in the market, their degree of product differentiation, the cost structure, the degree of vertical integration with suppliers & so on).

→ Determines conduct (which consist of price, research & development, investment, advertising, and so forth)

→ conduct yields market performance (efficiency, ratio of price to marginal cost, product variety, innovation rate, profits & distribution).

3. Problems with first wave literature:-

This paradigm although plausible, often rested on loose theories, and it emphasized empirical studies of industries.

- a typical regression had the form $R_i = f(R_i, BE_i, \dots)$

→ where i denoted industry, R_i denoted some measure of firm or industry profitability, (R_i) was a concentration ratio (a measure meant to summarize how non competitive the industry is), and BE_i (for barriers to entry) referred to variables that measured the difficulty of entering the industry. → other variables could be introduced in the regression as well.

→ The links (or the absence of links) b/w variables must, however, be interpreted as correlations or "descriptive statistics," not a causal relationships.

- The absence of causal interpretation is troubling for analyst what is to be made of regression showing that the rate of return in an industry grows with the concentration in that industry?
 - Says little about causes of concentration or Mkt Power.
 - fails to guide Analyst.
- The empirical tradition certainly failed to measure more basic (exogenous) conditions,
 - often difficult to gather data that are accurate measures of basic conditions and are comparable across industries.
- It is fair to say that more formal theory was completely left aside.
So,
 - Plausible but weak theoretical framework
 - large panel studies with many firms.
 - Relationship are more correlations & not causation.
 - rate of return \longleftrightarrow Concentration of industry
 - Due to Correlation based analysis it was particularly difficult to devise industrial policy.
- Second wave tradition:- In particular the "Chicago Tradition," starting with Aaron Director & George Stigler, emphasized the need for rigorous theoretical analysis and empirical identification of competing theories.
- Still, by the early 1970s it was felt that in many instances theory was more a way of explaining statistical results or of buttressing particular intellectual positions than a rigorous and systematic investigation.
- The Second wave of interest, which was mainly theoretical started in 1970's.

- Mainly General Equilibrium based analysis
- Non-cooperative game theory based research
- Incorporation of Dynamic & Symmetric Information.
- Made serious progress in two crucial areas: Dynamics & asymmetric information.

→ What will we study in this book?

- Mainly Second wave literature explaining theoretical underpinnings of economic phenomena in industry.
- Scope of govt, in terms of indirect intervention in the market through anti-trust & fairness regulation in business practices.
- Formulation of business strategy & consumers assessment of efficiency.

→ Market Definition, Partial Equilibrium, and Welfare Criteria:-

: The Competitive Paradigm:

- competitive-equilibrium paradigm of "Arrow & Debreu" → best-developed & most aesthetically pleasing model in field of economics.
- 1) → • Fine Description of available goods - Economic goods
 - An economic good is characterized by its physical properties, the date on which & the state of nature in which it is available, its location & so forth.
- 2) → consumers are perfectly informed about all goods, Properties & have preferences over bundles of goods.

- 3) Firms are owned by consumers & have endowment & have production Possibility Curves.
 - 4) All agents are price takers
 - 5) The Consumers maximize their welfare given that their expenditures must not exceed their income. \rightarrow give rise to demand functions
 - 6) Producers maximize profits over their technological possibilities \rightarrow give rise to supply functions.
 - 7) A competitive equilibrium is a set of prices, with associated demands & supplies, such that all the markets (one for each good) clear (i.e. total demand does not exceed total supply).
- Weak assumptions about preferences and technological possibilities yield general result on competitive equilibrium.
 \rightarrow Two fundamental welfare theorems
- \rightarrow Two fundamental theorems of welfare:
- 1st Welfare Theorem: States that in a perfectly competitive market with well-defined property rights & individual preferences, the resulting market equilibrium will be Pareto efficient. This means that in a competitive market, the allocation of goods and services will be such that no individual can be made better off without making someone else worse off.
- 2nd Welfare Theorem: any Pareto efficient allocation of resources can be achieved through a competitive market mechanism as long as certain conditions are met. This means that if a particular allocation of resources is Pareto efficient, it can be

achieved by assigning initial endowments of goods & services to individuals in a competitive market in a way that results in a desired outcome.

- 1st, decentralized competitive equilibrium is Pareto efficient.
- 2nd, Any Pareto optimal choice can be decentralized by choice of right prices & appropriate redistribution of income.

→ A key property of competitive equilibrium is that each good is sold at marginal cost.

• Pareto optimality of competitive equilibrium.
→ The first fundamental welfare theorem strongly limits the scope of industrial organization.

→ Partial Equilibrium, Downward Sloping Demand Curves, and Consumer Surplus:-

- Demand for a good decreases with its price & that change in consumer welfare can be measured by the so-called Consumer Surplus.
- The demand for a good is assumed to decrease with its own price and to be independent of prices of other goods and of consumers' income.

"Quasi-linear" utility function : $U(X, Y) = f(X) + Y$

$f(X)$ is strictly increasing function of X & $U(X, Y)$ is linear in Y but not linear in $f(X)$.

- Quasi linear function of this type are similar to log functions & Power functions.

- $U(X, Y)$ exhibits constant marginal utility in Y .

Def: Numeraire is a common yardstick so that value of all commodities can be measured in a common scale \rightarrow Monetary Numeraire)

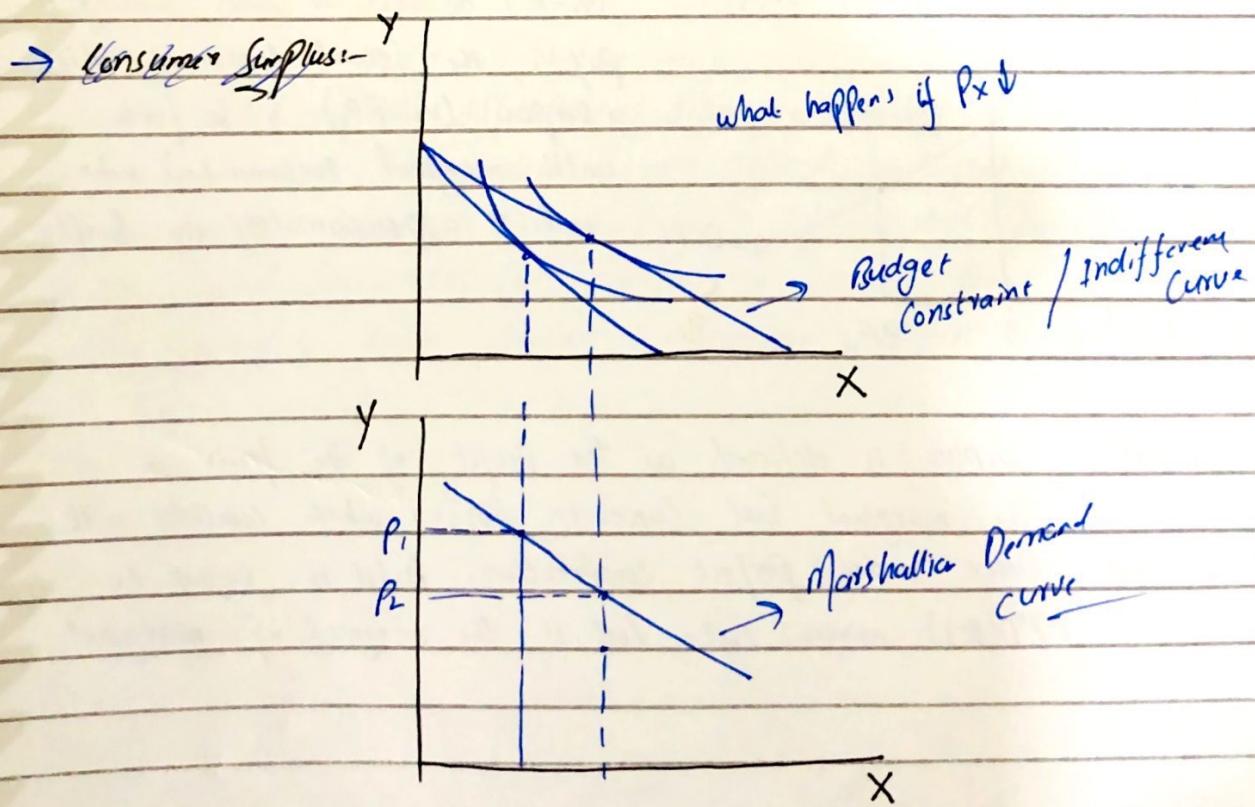
- Function makes it possible to separate impacts of X & y & study it.

$$U(q_0, q_1, \dots, q_m) = q_0 + \sum_{h=1}^m V_h(q_h)$$

where good 0 is numeraire and functions V_h are increasing & concave. Maximizing U subject to the budget constraint.

$$q_0 + \sum_{h=1}^m p_h q_h \leq I$$

where I is consumer income, yields $V_h'(q_h) = p_h$ for all h . Thus each consumer's demand function for good h , and therefore the aggregate demand function satisfies, the above conditions.

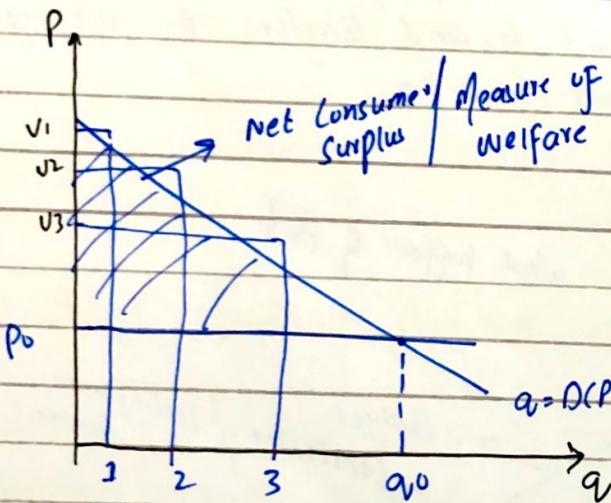


→ Analysis of Consumer welfare / Consumer Surplus:-

- The Consumer Surplus is defined as the area between the demand curve and the horizontal line at price level p . A measure of what the consumers would be willing to pay in excess of what they already spend ($p_0 q_0$) for the right to consume q_0 units of goods.

Total consumer Surplus

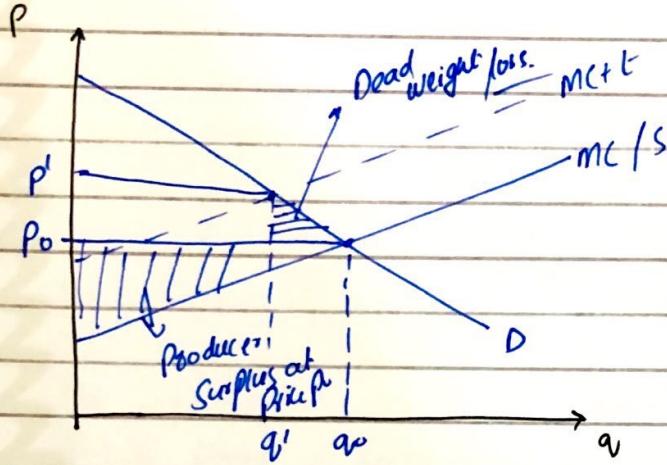
$$(v_1 - p^*) + (v_2 - p^*) + \dots + (v_{n-1} - p^*)$$



→ first consumer realize a surplus $(v_1 - p^*)$, because he was willing to pay v_1 , the second consumer realize a surplus $(v_2 - p^*)$ & so forth until marginal consumer (n) who realizes approximately no surplus.

- The Producers Surplus is defined as the profit of the firm in the industry. The marginal cost curves in Fig(1) which coincides with the Supply Curve under perfect competition. Profit is equal to revenue ($P^* D(P)$) minus cost. Cost is the integral of marginal cost

∴ Dead weight loss / And Producers Surplus



→ The aggregate welfare in the industry, or the total surplus, is equal to Consumer Surplus plus the Producer Surplus.

→ The total Surplus is maximized when the consumer price is equal to the Marginal Cost. (P^*) in

→ what is a market?

Present book, empirical difficulty of defining a market will be ignored. It will be assumed that the market is well defined, and that it involves either a homogenous good or a group of differentiated products that are fairly good substitutes (or complements) for at least one good in the group & have limited interaction with rest of the economy.

Chapter H02 The Theory of the firm

→ Introduction:-

- The notions of a "firm" of "vertical integration", and of "authority" are by no means simple, and consequently they have been given various meanings in the literature.
- It is customary to distinguish - not always without ambiguity - the horizontal and vertical aspects of a firm's size.
 - The horizontal dimension refers to the scale of production in a single-product firm or to its scope in a multi-product one.
 - The vertical dimension reflects the extent to which goods and services that can be purchased from outsiders are produced in house.
 - A wallpaper manufacturer merging with another wallpaper manufacturer or ~~a tile merging with another wallpaper manufacturer~~ ↳ a tile producer engages in horizontal integration.
 - A wine maker purchasing a bottle or cork factory engages in vertical integration.

In simple terms, a firm is a business organization that produces goods or services for profit.

Vertical & Horizontal aspects of a firm:-

- Horizontal aspects of a firm refer to the range of products or services that a company produces in a particular industry. For example, a company that produces different types of drinks, such as soda, juice & water, is said to have a broad horizontal scope.
- Vertical aspects of a firm refer to how involved the company is in the different stages of the production process. A company that controls everything from raw material extraction to retailing is said to have a vertical scope.

Section I

- Size of firms
 - Synergy view
 - Contractual view
 - Incomplete contract view

Section II

- Behavior of firms

cost minimization

Section I :-

- Synergy view:- first the firm will be regarded as a synergy b/w different units at a given point in time to exploit economies of scale or scope.
 - Various forms of cost or demand complementarities
 - cost per unit decrease → Synergy achieved
- Overall, the Synergy view of a firm suggests that companies can create value and achieve better results by collaborating, sharing resources, and leveraging their collective strengths.

- 2) Contractual view:- of a long-run arrangement of its units, brings us to the Williamsonian theory of hazards of idiosyncratic exchange in a long-run relationship.
- A buyer & supplier relationship.
 - The supplier may not find alternative outlets, and the buyer may not be able to contract with a new supplier on time.
 - Switching cost → specific investment \rightarrow minimize cost
 - long term understanding \rightarrow (uncontracted \rightarrow new supplier
 - ↳ understanding with new supplier & all
 - ↳ cost bear firm to build up understandings
 - specific investment: fifa world cup \rightarrow being sold to anthem only.
 - ↳ if fifa world cup end \rightarrow plant investment is wasted.
 - A firm is a collection of legal contracts between various parties, such as shareholders, employees, suppliers, and customers. It emphasizes the importance of these contracts in defining the rights, responsibilities, and incentive of the parties involved.

3). The Incomplete Contracting View:- \rightarrow legal definition.

It starts from the idea that contracts are necessarily incomplete, because some contingencies are unforeseeable or because there are too many of them to specify in writing, so that cost minimization requires the original contract to define only the broad lines of the relationship.

- The incomplete contracting view of a firm is a concept that suggests that it is impossible to fully anticipate or specify

all the contingencies that may arise in a contractual relationship.

- This means that contracts b/w parties are inherently incomplete, and there may be gaps or ambiguities in their terms that are not fully resolved or anticipated
- limitations of fully specified contracts and emphasizes the role of firms in reducing transaction cost. and facilitating cooperation and coordination among stakeholders.
- Section II:- takes the firms as well-defined entities. Rather than analyze their size, it investigates how firms behave.

1) What is a firm:-

- 1.1) The Firm as a Loophole for the Exercise of Monopoly Power :-
 - Firms can circumvent the legal framework to quietly exercise their monopoly power.
 - Firms can use their organizational structure to create and maintain a monopoly in the market. This occurs when firms use their internal resources and capabilities to limit competition and exclude potential rivals, rather than relying on market forces to determine prices & output levels.

- Price Discrimination:- firm may want to sell a given product in different markets at different prices. This raises the possibility of arbitrage among the retailers serving these markets.
- By charging different prices to different customers, firms can extract more revenue from those who are willing and able to pay more, while still capturing the business of those who are less willing or able to pay higher prices. This can help firms to maintain higher prices overall, even if they face competition from other mktcs as well.

- Intermediate price controls:- refers to the practice of setting prices for goods or services at a level that is somewhere between the competitive market price and the monopoly price.
 - It can play a role in mitigating the negative effects of market power. \rightarrow large no of sellers/buyers.
 - By setting prices at an intermediate level, regulators can limit the ability of firms to charge monopoly prices & extract excessive profits from consumers.

2.2) The firm as a static Synergy.

- The size & the number of the firms in an industry are related to the degree of returns of scale.
- Extent to which it can exploit economies of scale or scope.
- Such economies of scale related to the volume of a single product are called product-specific economies. → units costs decrease.
- A plant with a larger no. of machines can sustain a flow of output proportionally higher than one with a small number.
- A firm serving several markets with variable demands faces less uncertainty than a collection of separate firms serving these markets independently, and therefore can save on costly peak-load investment.
- Similarly, a firm serving several markets with (imperfectly correlated) variable demands faces less uncertainty than a collection of separate firms serving these markets independently, & therefore can save on costly peak-load investment.

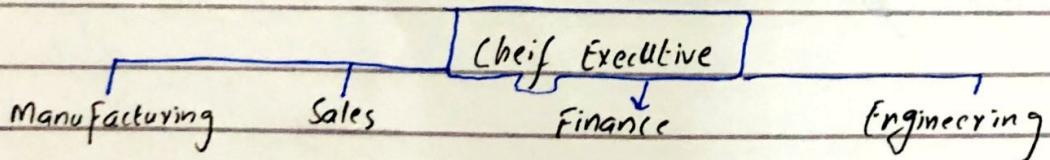
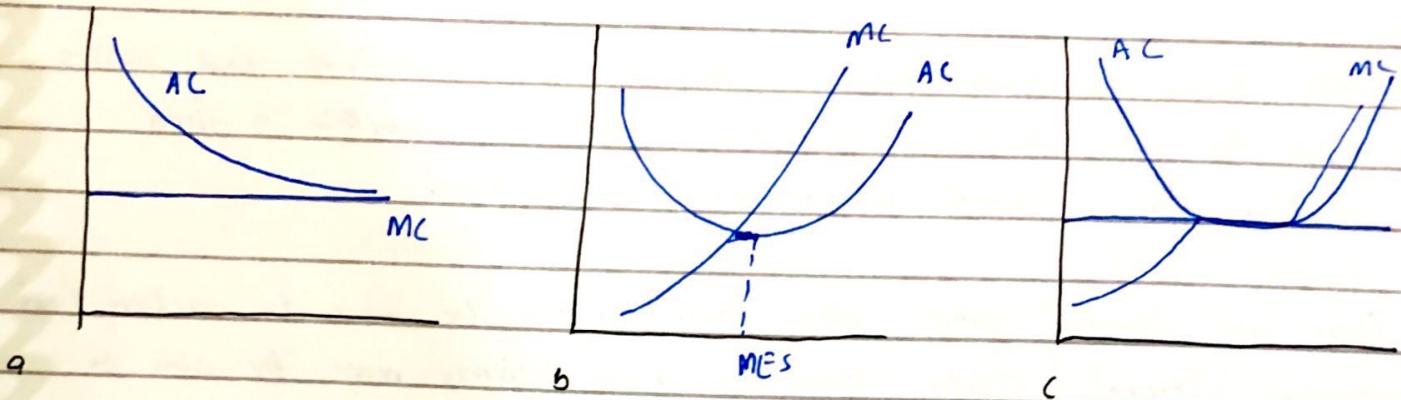


Figure 3 :- An example of unitary-firm organization.

- This sort of organization can be seen as an attempt to exploit potential economies of scale.

Figure 2:



Everywhere decreasing marginal costs imply everywhere decreasing average costs, and everywhere decreasing average costs imply subadditivity.

→ Is the Technological view a 'Theory of the firm'?

The technological view aims at defining the size of a firm. Economics of Scale encourage the gathering of activities. And the limit to the size stems from the fact that average cost curves rise at high output. There are two related reasons why this view as it stands, does not quite constitute a theory of firm size.
First, it is not clear why economies of scale should necessarily be exploited within the firm.

Second we should not take it for granted that average cost-curves rise at high output.

$q_1 + q_2$ cost & q_1 and q_2 separable costs?

Other Sources:-

He defines as static Synergy as "any cost reduction that arises from the fact that production is organized within a firm rather than through a market transaction."

- There are several ways why firms might be able to achieve cost savings through static synergies. First, firms may be able to achieve economies of Scale by producing a large quantity of output. Second, firms may be able to achieve economies of Scope by producing multiple related products. Third firm may be able to reduce costs by coordinating their activities more effectively than would be possible through a market transaction.
- The existence of static synergies is a major obstacles to the working of the market mechanism. This is because static synergies make it difficult for firms to enter and exit markets, which can lead to market power & higher prices.
- Examples of static synergies
 - A firm that produces car may be able to achieve economies of scale by producing a large no of Cars.
 - A firm that produces both cars & trucks may be able to achieve economies of scope by sharing some of its production facilities & resources.

- A firm that produces cars may be able to reduce costs by coordinating its research & development activities more effectively than would be possible through a market transaction.
- firms exist because they can bring together different inputs such as labor, capital and technology, to produce goods & services more effectively/efficiently than if these inputs were organized separately. This synergy arises from factors such as economies of scale, scope & learning.

3.4) The Firm as an Incomplete Contract:-

- First, some contingencies which the parties will face may not be foreseeable at the contracting date.
 - Second, even if they could be foreseen, there may be too many contingencies, to write into the contract.
 - Third, monitoring the contract, may be costly.
 - Fourth, enforcing contracts may involve considerable legal costs.
- Arbitration:- The first type of resort to a third (unconcerned) party is external arbitration. For instance, a union and a firm may agree to go to binding arbitration if negotiations on a labor contract become stalled.

Authority:- The power to fill unspecified contingencies - authority may be given to one of the concerned parties rather than to an arbitrator.

- A contract as "an agreement between two or more parties that specifies the rights & obligations of each party." The contracts are incomplete because it is impossible to specify all possible contingencies in advance. This is because the future is uncertain and it is impossible to predict all possible events that could occur.
- As a result of incomplete contracts, firms must rely on trust and cooperation to ensure that they are able to achieve their goals. This is because contracts cannot cover all possible contingencies and there will be times when parties to a contract will disagree about how to proceed.
- It recognizes that contracts between parties, including firms, are inherently incomplete due to various factors such as uncertainty, limited information, and the inability to foresee all future contingencies.
- It is impossible to specify and anticipate all possible situations, actions & outcomes in a contract. The real world is dynamic and circumstances may change, leading to new situations & challenges that were not originally foreseen or addressed in initial contract.

- The incomplete nature of contracts give rise to gaps, ambiguities, and uncertainties regarding the rights, obligations and decision making authority of different parties within a firm.
 - To address these gaps, Hierarchical control, Adaptation & flexibility, Relational contracts, Monitoring & incentives, legal & regulatory frameworks.
- Here are some key points that rule makes about the firm as an incomplete contract

1.3) The firm as a long-run Relationship:-

This concept emphasizes that firms often operate in a context of repeated interactions and long-term relationships with various stakeholders, such as employees, suppliers & customers.

Many economic transactions, parties engage in long-term relationships rather than engaging in one time, spot market exchanges. Such long-term relationships offer benefits and incentives that differ from those in short term interactions.

The firm as a long-run relationship has several key implications:-

1. Mutual investments:
2. Relationship specific contracts
3. Trust & Reputation
4. Information sharing & learning
5. Renegotiation & adaptation

→ Here are some of the key points that Tivole makes about the firm as a long-run relationship:

- Firm are long-run relationships because they involve repeated exchange of goods, services or information.
- Firm must be able to manage their relationships effectively.
- Trust & cooperation are essential for the smooth functioning of relationship.

firms can invest in relationship-specific assets to build trust & cooperation.

- idiosyncratic Investment & Asset Specificity
- Bargaining
- Contracting
- switching cost → specific investment] minimize cost

2) The Profit maximization Hypothesis:-

- This hypothesis is a fundamental assumption in economics that suggests firm aim to maximize their profits when making decisions. The firms will always try to maximize their profit. This means that they will try to produce the quantity of output that will generate the highest possible profit.
- The profit maximization hypothesis states that firms, as rational economic agents, seek to maximize their profits by making choices that maximize the difference between their total revenue & total costs. Firms are primarily motivated by the desire to earn the highest possible profits given the constraints they face.
- Reasons why firms might want to maximize their profits;
 - first, profits are a measure of how well a firm is doing.
 - Second, profits can be used to reinvest in firm, which can help it to grow & become more successful.
 - Third, profits can be used to pay dividends to shareholders, which can make them happy and more likely to invest in the firm.
- Marginal Revenue equals MC.
- By Reducing their costs.

Key points related to profit maximization hypothesis:-

1. Objective of Profit Maximization
2. Decision making framework
3. Cost & revenue considerations
4. Market competition

It is important to note that profit maximization hypothesis is a simplifying assumption used in economic analysis to provide a theoretical framework for understanding firm behavior.
→ Firms may have additional objectives, such as market share growth, long-term sustainability, or social responsibility.

3) The Principal Agent problem:-

→ Chapter 03 :- Monopoly

Industrial Economics

Introduction:-

→ This chapter discusses various arguments made in favor of and in opposition to monopoly power. we will assume that the goods produced by the monopolist are given, and that their qualities are known by the consumers.

- ↳ Also monopolist charges the same price for unit of good for each good produced.
- ↳ No price discrimination.

Price above marginal cost without losing all its clients, such behavior leads to a price that is too high and to a "dead weight" loss welfare loss for society

• Single Product monopolist and a multi-product monopolist with interrelated production costs if or interrelated demands for his various products.

• Inter-temporal pricing behavior of a durable good monopolist.

• More difficult for owners of a firm to keep control over its costs when the firm has monopoly power on product market.

• Thus a monopolist may produce given outputs at a higher cost than a competitive firm.

• Monopoly Power/Profit should not always be taken into account in the expression of welfare.