

The Economics of Industry
Exam Review

June 14, 2002

1 Notes on Key Articles and Models

1.1 Maskin and Tirole - Dynamic Oligopoly

- In Edgeworth cycle theory, firms undercut each other successively to increase their market share (price war phase) until the war becomes too costly, at which point some firm increases its price. The other firms then follow suit (relenting phase), after which price cutting begins again.
- The market price for a kinked demand curve is stable in the long run. This focal price is sustained by each firm's fear that, if it undercuts, the other firms will do so too. A firm has no incentive to charge more than the focal price because it believes that, in that case, the other firms will NOT follow.
- Notice that during the price war phase, a firm undercuts not simply to increase market share but because, with good reason, it does not trust its rival. That is, it anticipates that maintaining its price will not prevent the other firm from being aggressive. In that sense, mistrust is a self justifying attitude.
- One may wonder why firms attach positive probability to maintaining the competitive price, where they make no profit. The explanation is that relenting is a public good from the firms' point of view. Both firms wish to raise their prices, but each would like the other to raise its price first so as to be able to undercut.

1.2 d'Aspremont, Jacquemin and Gabszewicz - Price Leadership Cartel Model

- In contrast to results involving a continuum of firms, with a finite number of firms, there is always a stable dominant cartel.
- With a continuum of firms there is always an incentive for a cartel member to join the competitive fringe independent of the size of the cartel.
- The major difficulty in forming a merger is that it is more profitable to be outside a merger than to be a participant. The outsiders sell at the same price but at a much larger output at which marginal cost equals price. Hence, the promoter of a merger is likely to receive much encouragement from each firm - almost every encouragement, in fact, except participation.
- With a continuum of firms a movement in or out of the cartel has a negligible impact on price and on per firm profits consequently, both problems identified affect the price leadership model. With a finite number of firms, the situation is quite different.
- Internal Stability: (k firms in the cartel).

$$\pi_f(k-1) \leq \pi_c(k).$$

- External Stability:

$$\pi_c(k + 1) \leq \pi_f(k).$$

- A cartel with k members is internally stable if and only if the cartel with $k - 1$ members is externally unstable.
- The fraction of firms in a stable cartel would asymptotically approach zero as the number of firms approaches infinity. This is because the larger the number of firms, the smaller the impact of exit on price and profits thus increasing the likelihood of a particular cartel becoming unstable.
- The crucial feature determining whether a cartel exhibiting price-leadership behaviour will be stable is the size of the effect on price and profits that the addition or loss of a cartel member would have.

1.3 Green and Porter - Imperfect Information Cartel Model

- The optimal cartel structure may be one which provides member firms with strong positive incentives which make collusive behavior attractive rather than one which provides insufficient incentives and which severely punishes defecting firms after the fact.
- Incentives in these equilibria are so perfect that the deterrent mechanisms are never observed.
- The fact that both monopolistic and Cournot performance are observed will make it possible to identify statistically the collusive equilibrium under uncertainty.
- Key Point. It might be asked why Cournot equilibrium is appropriate at all. If firms know at a particular time that a low price has been observed in the past, and that the cartel has had a perfect record of monopolistic conduct, why do firms not disregard the price and continue to act monopolistically? The answer is that everyone understands the incentive properties of the equilibrium. If firms did not revert to Cournot behavior in response to low prices, monopolistic behavior would cease to be individually optimal for firms.

1.4 Krep and Wilson - Chain Store Paradox of Predation

- If rivals come to fear from a multimarket seller's actions in market A that entry or expansion in Markets B and C will be met by sharp price cuts or other rapacious responses, they may be deterred from taking aggressive actions there.
- Chain Store Paradox by Selten. In a very simple environment, there is no means by which thoroughly rational strategies in one market could be influenced by behavior in a second essentially independent market. What is lacking, apparently, is a plausible mechanism that connects behavior in otherwise independent markets. Imperfect information is one such mechanism.

- Sequential equilibria exist for all finite extensive games. They are subgame perfect Nash equilibria.
- In words, we assume that any acquiescence is viewed by the entrants as proof that the monopolist is weak and the entrants are unshakeable in this conviction one it is formed.
- The remarkable fact about this equilibrium is that even for very small δ , the reputation effect soon predominates. Even if the entrants assess a one in one thousand chance that the monopolist would prefer to fight, if there are more than ten stages to go the entrant stays out because the monopolist will surely fight to preserve its reputation.
- We have a model where reputation is easily shattered, making it all the more valuable. The power of reputation seems to be positively related to its fragility.
- We can the monopolist do prior to the entrant's decision point to make predation optimal in the short run? Answers include expanding capacity, sales networks, etc.

1.5 Mathewson and Winter - Vertical Restraints

- Focus on the following restraints: 1) Resale price maintenance (price floors); 2) Territorial protection (exclusive retailer rights); 3) Quantity Forcing (Retailer must sell a minimum volume); 4) Franchise fees (payment of a fixed fee to carry the manufacturers product).
- At the source of these effects is a set of three externalities. In setting P_i and A_i , the retail firm does not appropriate the additional increment in profits that flows to the upstream manufacturer through the $(P_w - c)$ wedge when P_i is lowered or A_i is raised. In fact, this vertical externality distorts any action of the retailer that affects demand. This externality works to increase P_i - the double marginalization effect of Spengler (1950) - and to reduce A_i relative to the levels for the efficient manufacturer - retailer contract, other things held constant. The inadequacy of the retailer's incentive to advertise under these conditions is compounded by the horizontal externality present with spillovers (with $\alpha > 0$); the retailer does not consider the informational gain to other outlets when setting A_i .

1.6 Robinson and Chiang - Sutton Critique

- Exogenous sunk cost markets have lower minimum values of concentration than endogenous sunk cost markets. Increasing market size reduces concentration's lower bound faster in exogenous sunk cost markets.
- Sutton classifies the cost to develop a manufacturing plant of minimum efficient scale (MES) as a key exogenous sunk cost.

- In an exogenous sunk cost market, Sutton also predicts that an increase in the toughness of price competition shifts this lower bound upward. (though it still approaches zero just at a slower rate).
- Sutton only predicts that tough price competition is important in exogenous sunk cost markets. This is because endogenous sunk cost spending can increase product differentiation which decreases the importance of price competition.
- In his model, a firm trades short term losses from endogenous sunk costs for long term revenue gain. As market size increases, long term revenue gains increase. Because of these long term revenue gains, increasing market size leads to a competitive escalation of short term spending. Eventually this competitive escalation of spending becomes too high for a new entrant to handle. At this point, entry is blockaded.
- ?? Sutton also predicts that there is no longer any monotonic relationship in general between market size and minimal concentration levels. It depends on how many firms are in the market before the escalation mechanism kicks in. ??
- Exogenous sunk cost models have low advertising and low R and D expenditure. Endogenous have one and or the other. Markets with tough price competition have at least one of the following characteristics: a standardized rather than customized product, they product either raw or semi-finished materials, or face infrequent buyers orders.

1.7 Sutton - Gilbrat's Legacy

- Gilbrat's Law: It amounts to saying that the expected value of the increment to a firm's size in each period is proportional to the current size of the firm.
- Two statistical regularities (Evans and Samuelson). Size and Growth: a) The probability of survival increases with firm size. b) The proportional rate of growth of a firm conditional on survival is decreasing in size. The Life Cycle: For any given size of firm, the proportional rate of growth is smaller according as the firm is older, but its probability of survival is greater.
Thus, larger firms have lower growth rates, but are more likely to survive.
- Shakeout: It is frequently observed that the number of producers tends firm to rise to a peak, and later falls to some lower level.

1.8 Ghemawat and Nalebuff - Firm Exit

- They consider a homogeneous goods industry with a particular kind of cost structure: unit costs are constant up to full capacity, and fixed costs are proportionate to plant capacity (as opposed to current output). Capacity can be reduced irreversibly in a continuous manner over time. Along the equilibrium path of the game, the largest firm sheds capacity until it is equal in size to its nearest rival then both these shrink together until they hit the size of the next largest ... and so on.

- Intuitively, bigger firms have lower marginal revenue and correspondingly greater incentive to reduce capacity.
- Backed up damn well by US Soda Ash industry.