M.A. Semester IV, Economics Paper- I- Micro Economic Analysis

Prisoner's Dilemma

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Prisoner’s Dilemma

- A classical example in game theory, called the Prisoners’ Dilemma , explains the problem oligopolists face.
- It can be explained as follows: Two prisoners have been accused of collaborating in a crime. They were kept in separate cells and each has been asked of their guilt.
- If they both confess, each will receive a prison term of five years. If neither confesses, they both receive a term of two years. On the other hand, if one confesses and the other does not, the one who does will receive a term of only one year, while the other will receive a prison term of ten years. If you were one of these prisoners, what would you do — confess or not confess?

- The payoff matrix in Table 12.2 summarizes these possibilities. It shows the prisoners’ dilemma. If they could both agree not to confess, each would go to jail for two years only.
- But they cannot talk to each other, and even if they could, can they trust each other? If prisoner A does not confess, he risks being taken advantage of by prisoner B.

- No matter what prisoner A does, prisoner B will benefit by confessing. Similarly, prisoner A will always be ahead by confessing; so prisoner B must worry that, by not confessing, he will be taken advantage of.
- Thus, both of them will probably confess and go to jail for five years!

- Oligopolist firms often find themselves in prisoners’ dilemma, in that they must decide whether to compete aggressively and capture a large share of the market at the expense of their competitors or to **“cooperate”** and coexist with the competitor with the market share they currently hold, and, perhaps, implicitly collude.
- If the firms compete passively, setting high prices and limiting output, they will make higher profits than if they compete aggressively.

Table 2			
		Prisoner *B*	
		Confess	Do not Confess
Prisoner *A*	Confess	–5, –5	–1, –10
	Do not Confess	–10, –1	–2, –2

- However, like prisoners, each firm has an incentive to undercut its competitors, and also its competitors have the same incentive.
- It is desirable to cooperate with the competitors, instead of competing aggressively, but the problem is its competitor might compete aggressively and take the lion’s share of the market.

Prisoner's Dilemma- Implication of the Prisoners' Dilemma: For Oligopolistic Pricing:

- Does the prisoners' dilemma force oligopolistic firms to aggressive competition and low profit? It may not be necessary, like our prisoners, to have only one opportunity to confess. Most firms set price and output over and over again, continually observing their competitors' behaviour and adjusting their own accordingly.
- This allows firms to develop a reputation from which trust can arise. As a consequence, oligopolistic coordination and cooperation may prevail.
- For example, suppose an industry is made up of two or three firms which have coexisted for a long time.

- Over the years, the managers of those firms might have become tired of losing money because of wars, and an implicit understanding might have developed in which all the firms charge high prices, and no firm makes a serious effort to take market share from its competitors which they know will be short-lived and the result will be renewed warfare and lower profits over the long-run.
- The resolution of the prisoners’ dilemma may be possible in some industries, but not in others. Sometimes managers are not content with the moderately high profits resulting from implicit collusion but prefer to compete aggressively and wish to capture most of the market. Sometimes implicit understandings are difficult to reach and even harder to maintain.
- As a result, in many industries, implicit agreement is short-lived. There is, often, a fundamental mistrust and, so, ‘war of the business-world’ may erupt out of a simple pretext.

Study Material Reference

- WWW. Economics discussion. com