CHAPTER 10
GAMES, INFORMATION, AND STRATEGY

Chapter Outline

Chapter Summary

Questions

1. A *strategy* is a choice or a sequence of choices made by a decision maker when alternative choices are available to select from. In other words, it is a game plan that a player follows. Generally, once a strategy is chosen, a sacrifice of some kind occurs. For example, if, in anticipation of what a rival will do, a firm chooses to raise price, it has foregone the strategies of keeping price constant or lowering it.

2. In a *one-shot game*, each player makes a move without knowing what the other player or players will do and without any opportunity to make subsequent moves. This is also called a single-period, simultaneous-move game. Other games, called *repeated games*, may be played over and over again. In addition, there are *sequential games*, where each player makes a series of choices consistent with a game plan with a specific objective.

3. A player will have a *dominant strategy* if that person or firm will pursue the same strategic choices no matter what their rival does.

4. An *iterative dominance strategy* consists of examining the various possible outcomes and identifying *dominated* strategies of a rival. It is a way to determine strategic moves based on what a rival will do.

5. Tree diagrams are employed in *sequential games*.

6. Answers will vary, but all should involve a threat that one can definitely carry out. An example would be to threaten a price war if a rival dares to try a price cut. You can threaten to respond with retaliatory price cutting that would put both your firm and the rival in a loss position. If you have plenty of working capital and can withstand a loss for much longer than could your rival, your threat of retaliation is credible.

7. The term is *first-mover advantage*.

8. The definitions follow.

    a. *search costs*: the economic costs incurred by individuals and/or firms associated with analyzing and making a decision to engage in a transaction.

    b. *asymmetric information*: non-identical information held by parties to a transaction that may affect the outcome of that transaction.

    c. *adverse selection*: a self-sorting process that occurs when the information characteristics of a transaction are such that undesirable products, services, or customers are attracted to it.

    d. *moral hazard*: an incentive for a party to a transaction to engage in risky or undesirable behavior (to the detriment of another party) because the transaction protects the first party against loss.

    e. *private information*: relevant information known by the party on one side of a transaction that is not observable by the party on the other side.

    f. *monitoring costs*: the costs associated with making certain the terms of an agreement are complied with.

    g. *signaling*: taking an action or set of actions that conveys otherwise unobservable information from one party in a transaction to the party on the other side of it.

9. The firm that only hires people with a college degree, regardless of their major or course of study, is using the completion of the college degree program as a *signal* that the prospective employee has a certain level of tenacity and ability. Thus, one's having the degree conveys important information to the prospective employer.

10. This question is related to the problem of *adverse selection*. If health insurance were offered through bowling leagues, people who were poor health risks would join the leagues simply to get the insurance. It would be rational for them to do so. However, insurance companies would get a pool of customers heavily weighted towards those with health problems. When insurance is offered through employers the pool of insured persons is much more diverse.

Problems

1.

ACI

	Free L.D.	Reduced Rate L.D.
JT&T Free L.D.	**400**^{J} 80^A	**450**^{J} 60
JT&T Reduced Rate L.D.	**300** 100^A	**310** 90

a. In the payoff matrix above, the "J" superscripts indicate JT&T, strategy, while the "A" superscripts indicate that of ACI. For both firms the dominant strategy is to offer free long distance. If ACI offers free long distance, JT&T's payoff is $400,000 by also offering free long distance but only $300,000 if it offers reduced rates. The same pattern occurs if ACI offers reduced rates. Then JT&T's payoff is $450,000 if it offers free long distance but only $310,000 if it offers reduced rates. A similar examination shows that ACI is best off to offer free long distance, no matter whether JT&T does or does not.

b. The solution to this game is that both players will offer free long distance. There is a Nash equilibrium in the upper left cell, the payoffs will be $400,000 for JT&T and $80,000 for ACI. (Note that this is the only cell with two superscripts.)

2.

<div align="center">GAMMA</div>

	Standard Warranty	Extended Warranty
Standard Warranty	**50** 50	**30** 70^G
DELTA **Extended Warranty**	**70^D** 30	**50^D** 50^G

a. In the above payoff matrix, the "D" superscripts indicate Delta's strategy, and the "G" superscripts indicate Gamma's. The solution is a Nash equilibrium in the lower right cell. (Note both superscripts there.) Both firms have a dominant strategy, and that is to offer an extended warranty.

b. Since this is a zero-sum game, it might appear that gains from cooperation are not possible. However, since servicing extended warranties can be expected to cost the firms more than servicing standard warranties, cooperation to choose not to offer extended warranties could produce a net gain. With such cooperation, the solution would move to the upper left cell, where market shares remain the same but warranty costs are lower.

3. a. This problem can be solved by backwards induction. Starting with Firm B, it can easily see that not entering is a dominated strategy for A; therefore A will enter. Not entering would yield zero incremental profit for A. B's next move on the lower branch is to decide whether to charge a high price or a low one. This depends on what A does, but B can see that charging a high price is a dominated strategy for A. Therefore, B knows that A will both enter and charge a low price. B should also charge a low price, since if A chooses low price, B's payoff is higher than it would get if it responds with a high price ($120,000 vs. $70,000).

b. From A's point of view, it can see that proceeding along the lower (Enter) branch, B will charge a low price, since charging a high price on that branch is a dominated strategy for B. So, the result is that A will enter, and both firms will charge a low price. Incremental profits will be $120,000 for each firm.

4.

<center>EMBRAGER</center>

	70-Seat Plane	50-Seat Plane
70-Seat Plane	**240** 330	**320**^{C} 400^E
50-Seat Plane	**260**^{C} 310	**220** 340^E

<center>CANDU-AIR (row label)</center>

In the payoff matrix, the "C" superscripts indicate Candu-Air's strategy, and the "E" superscripts indicate Embrager's. Candu-Air does not have a dominant strategy. It will choose the 70-seat plane if Embrager chooses 70-seat but the 50-seat plane if Embrager chooses 50-seat. Embrager, however, is best off to choose the 50-seat plane *no matter* what Candu-Air does. There is a Nash equilibrium in the upper-right cell. Thus, both will choose to build the 50-seat plane.

5.

<center>ASHLEY'S</center>

	Offer Italian Items	Do Not Offer Italian Items
Offer Italian Items	**26**^{M} 15^A	**22** 12
Do Not Offer Italian Items	**22** 13^A	**24**^{M} 12

<center>McDOUGALL'S (row label)</center>

In the payoff matrix, the "M" superscripts indicate McDougall's strategy, and the "A" superscripts indicate Ashley's. McDougall's does not have a dominant strategy, but Ashley's does. Ashley's best result occurs by offering Italian food items *no matter* what McDougall's does. There is a Nash equilibrium in the upper left cell. Thus, both firms will offer Italian food items.

6. There is a goal conflict here, since the publisher's best result occurs when profit is maximized, whereas the author is best off if *total revenue* is maximized. With a downward-sloping demand curve and a positive and constant marginal cost, the profit maximum will always occur at a lower quantity and a higher price than at the quantity where marginal revenue equals zero. This is easily explained with a diagram:
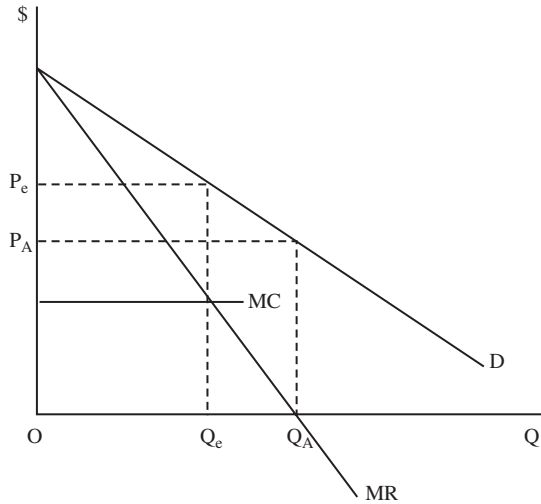
In the diagram, profit is maximized where $MC = MR$, at Q_e, P_e. Since the author receives a percentage of total revenue, author returns are maximized at Q_A, P_A.

7. The data can be combined as follows.

Pairs of Shoes Sold During Week	Total Bonus For the Week (dollars)	Marginal Bonus per Pair (dollars)	Marginal Value of Effort per Pair (dollars)
10	0	0	
20	40	4	1.00
30	60	2	1.50
40	80	2	2.25
50	100	2	4.50
60	120	2	6.90

Comparing the marginal bonus per pair with the employee's subjective valuation of the marginal cost of additional effort, one finds that it is not worthwhile for the employee to exceed 30 pairs per week, since the $2 per pair marginal bonus is less than the value she places on her additional effort. Therefore, $Q = \underline{\underline{30}}$ pairs, and total bonus is $\underline{\underline{\$60}}$.