

Basic Micro: More on the Firm

- Profit maximization is a basic tenet of micro.
- But is it realistic?
- Not always, because management is separated from ownership.
- Recipients of profits are not the agents whose decisions determine profit levels.
- Managers objectives differ from those of shareholders.

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- If shareholders are willing to control managers, there is the problem of **asymmetric information**.
- **Agency theory** is the area of economics that deals with this type of strategic interaction.
- A separate issue we will be interested in is what determines a firm's size.
- We'll look at this in two ways:

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■ Vertical Integration

- Use the firm or the market to obtain inputs.
- Each alternative has its own incentive problems.

■ Horizontal Extension

- How much of a given product to produce.
- How many different products to offer.
- The size is usually determined by where AC is minimized.

Games and Strategy

- Often it is the case where firms face the problem of **interdependent decision making**.
- We'll model/study this as if the firms were playing a **game**.
- A **game** is a model that depicts situations of **strategic behavior**.
- Here, a payoff for one agent will depend on its own activities
- as well as the actions of other agents.

Games and Strategy

- This situation introduces the consideration of the the optimal choice for a player.
- This will depend on what it conjectures other players will do.
- A game will consist of 3 things:
 - 1 a set of players
 - 2 a set of rules
 - 3 a set of payoff functions of each combination of strategies.
- For each combination of strategies by each player the respective matrix cell shows payoffs for each player.
- This is what we refer to as **normal form**.

Games and Strategy

- Here we are assuming both players choose their strategies simultaneously.
- In many situation this is not realistic, but it's ok if when decisions are made neither player knows what the other's choice is.
- Later we'll look at games where the assumption of sequential decision making is more appropriate.

Games and Strategy

- For a given game, we are interested in deciding what strategies we expect players to choose.
- We say that a player has a **dominant strategy** when it is strictly better than any other strategy regardless of the other player's strategy choices.
- If a player has a dominant strategy and is rational we would expect him/her to choose it.
- Here we do not even need to assume knowledge of the other players payoffs.
- In many games, there is what we will refer to a **prisoner's dilemma**.

Games and Strategy

- In most games, there are no dominant strategies.
- This requires a different approach to solving the game in the sense of predicting what will happen.
- We define a **dominated strategy** as one whose payoff is inferior to another strategy regardless of what the other player does.
- We expect a rational player to not choose a dominated strategy.
- As we'll see, solutions to games can be found by successively eliminating dominated strategies.

Games and Strategy

- However, the assumptions necessary behind iterative elimination of dominated strategies are much stronger than before.
- Unlike in the dominant strategies case where we assumed that players are rational.
- We are now assuming that each player assumes the other player is rational...
- and believes that the other player believes that the first player is rational.
- So now it no longer suffices that players are rational.
- We also need to assume that players believe that other players are rational.

Games and Strategy

- There are many games where there are no dominant nor dominated strategies.
- So we need a different approach to say what we expect to happen.
- In these games a player's optimal strategy depends on what the other player chooses.
- We therefore need a conjecture by Player 1 about Player 2's strategy and vice versa.

Games and Strategy

- This gives us a “solution” to the game:
- It is where players choose their optimal strategies given their conjectures of what other players do.
- And where such conjectures are consistent with other players choices.
- This situation is what we'll refer to as a **Nash equilibrium**.
- The use of the word **equilibrium** is appropriate in the sense no player can unilaterally improve his/her payoff by changing strategy.