

Mixed Strategies

- So far we've assumed particular choices ("pure strategies")
- **Mixed strategies** – randomizing over choices
- Sometimes no pure strategy equilibrium works
- Matching Pennies

		Player B	
		Heads	Tails
Player A	Heads	(1, -1)	(-1, 1)
	Tails	(-1, 1)	(1, -1)

- There is no dominant strategy here
- Also, no Nash equil
 - Consider a box – does a player have an incentive to change?
- What to do?
 - Find probabilities of heads and tails that make the other player indifferent
- Define
 - $P_B = \text{Pr}(\text{player B chooses heads})$
 - $1 - P_B = \text{Pr}(\text{player B chooses tails})$
- What P_B makes A indifferent between playing Heads and Tails?

- A's payoffs
 - If she plays Heads = $P_B - (1 - P_B) = -1 + 2 P_B$
 - If she plays Tails = $- P_B + (1 - P_B) = 1 - 2 P_B$
- When are these equal?
 - $P_B = 1/2$ (Similarly, $P_A = 1/2$)
- This is a Nash Equilibrium
- Intuition:
 - Suppose A chose Heads most of the time
 - Then B would choose Tails most of the time
 - Not an equilibrium
- What contexts are like this?

Factor Markets

- Factors – labor, etc.
- Factor demand and supply are different
 - Labor market is instructive
- Demand
 - “derived demand” for inputs
 - Not based on utility
 - Rather, does value of additional input exceed cost?

One Variable Input

- E.g. competitive input and output markets
- Hire more input(s), as long as the additional revenue from hiring them exceeds the cost
- Or as long as $MRP = MR * MP > \text{cost}$
- Labor
 - in perfectly comp. output market, $MR = P$
 - Choose L such that $MRP_L = MP_L * P_{\text{output}}$

Mathematical Example

- What if firm has market power in the output market?

Labor Supply

- Deep question: how do hours worked respond to wage?
- Think of labor supply as the “flip side” of leisure demand
- Apparatus

Labor Supply Curve

Monopoly Power in Factor Markets?

What Do Unions Do?

- Union is monopsony seller of labor
- Possible objectives
 - Maximize wage bill= $w*L$
 - Maximize total excess of wage bill over “cost” (“monopoly solution”)
 - Maximize employment
- Diagram