

## ECON1006 Full Semester Lecture Notes HD

- Multiple NE in Pure Strategies (e.g. Boxing & Ballet) – the NE = (boxing, boxing) and (ballet, ballet) – likelihood of either payoff depends on the payoffs, in this case, there are two pure NE
  - **Coordination Problem** – payoffs require coordination (e.g. meeting starting time)

Payoff Matrix for The Battle of the Sexes		Wife	
		Boxing	Ballet
Husband	Boxing	2, 1	0, 0
	Ballet	0, 0	1, 2

- No NE in Pure Strategies (e.g. Matching Pennies – if they match A wins, if not, B wins) – there is no NE
  - It is important to remain unpredictable in this game, otherwise the player can anticipate what move to do – there will be **one NE in mixed strategies**

Payoff Matrix for Matching Pennies Game		B	
		Heads	Tails
A	Heads	1, 0	0, 1
	Tails	0, 1	1, 0

- Other Examples of This Type – soccer penalty kicks

### • Solving for Mixed Strategies

- In “matching pennies” type games, with no pure strategy equilibria, being predictable by the other player means you lose, they win – need to choose actions randomly by assigning some probability to the likelihood that they can play each action
- Results Tennis: when remaining unpredictable in serves, men win a point **64%** of the time, and women win a point **56%** of the time (due to physical differences)

- **Dominant Strategies**: when a player has an action that produces a higher payoff for each possible action all other players can choose

- Example: Coke & Pepsi – dominant strategies for both firms are low price – this implies a unique NE in pure strategies

Payoff Matrix for The Pricing Game		Pepsi	
		High Price	Low Price
Coke	High Price	10, 10	2, 14
	Low Price	14, 2	5, 5

- Example: Ballet vs. Boxing – neither player has a dominant strategies – no unique NE in pure strategies
  - This example has 2 NE in pure and 1 NE in mixed

Payoff Matrix for The Battle of the Sexes		Wife	
		Boxing	Ballet
Husband	Boxing	2, 1	0, 0
	Ballet	0, 0	1, 2

- Example: Matching Pennies – neither player has a dominant strategy – no unique NE in pure strategies
  - This example has 1 NE in mixed

Payoff Matrix for Matching Pennies Game		B	
		Heads	Tails
A	Heads	1, 0	0, 1
	Tails	0, 1	1, 0