

## 14.12 Economic Applications of Game Theory

- Professor: Muhamet Yildiz

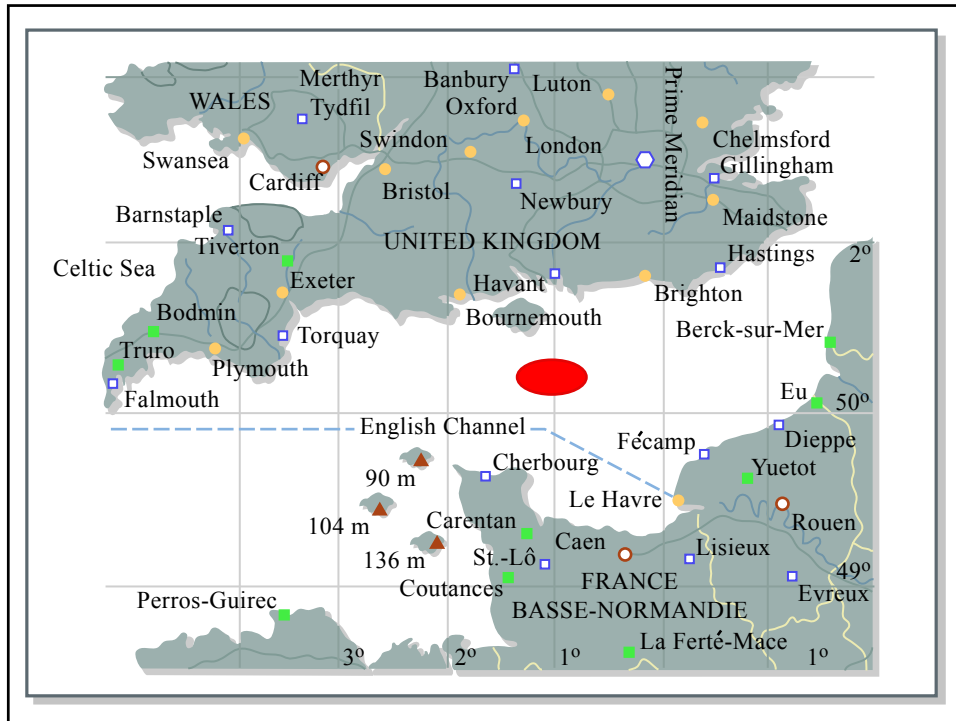


Image by MIT OpenCourseWare.

## Name of the game

Game Theory = Multi-person decision theory

- The outcome is determined by the actions independently taken by multiple decision makers.
- Strategic interaction.
  - Need to understand what the others will do
  - ... what the others think that you will do
  - ...

## A coordination game

	Left	Right
Top	(1,1)	(0,0)
Bottom	(0,0)	(1,1)

# A game

	2	L	m	R
1	T	(1,1)	(0,2)	(2,1)
	M	(2,2)	(1,1)	(0,0)
	B	(1,0)	(0,0)	(-1,1)

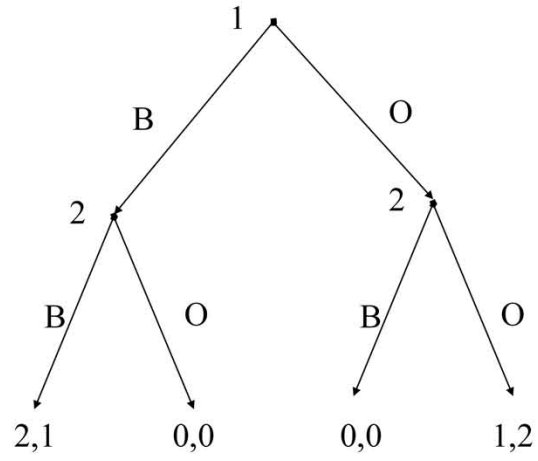
## A coordination game

	Left	Right
Top	(1,1)	(0,0)
Bottom	(0,0)	(1,1)

## Battle of Sexes

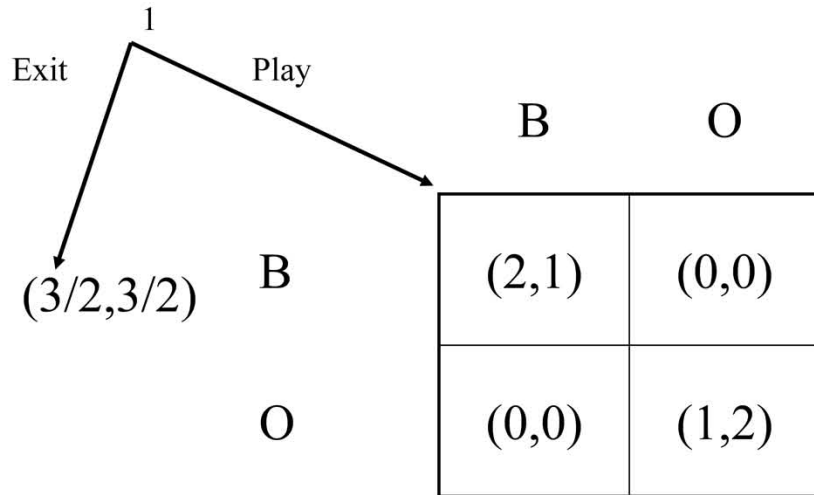
	Baseball	Opera
Baseball	(2,1)	(0,0)
Opera	(0,0)	(1,2)

# Battle of The Sexes with perfect information

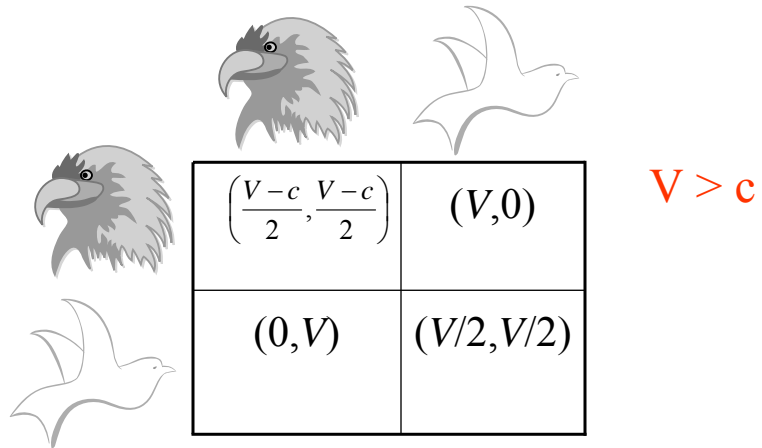






## Battle of Sexes with outside option



# Hawk-Dove game



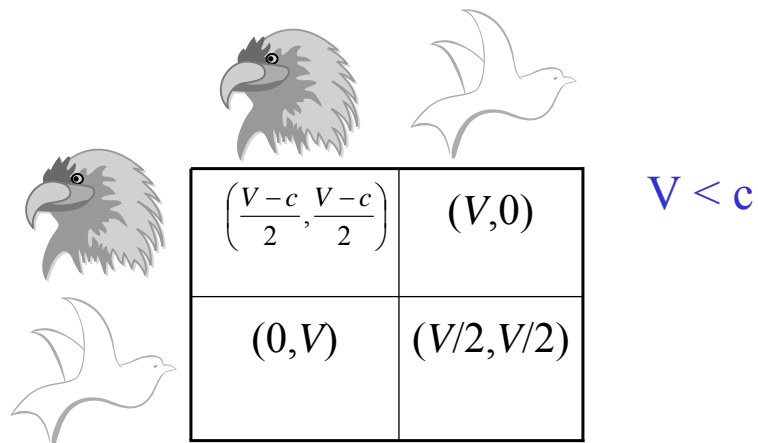
The image shows a 2x2 payoff matrix for the Hawk-Dove game. The rows represent the strategies of the first player (Hawk or Dove), and the columns represent the strategies of the second player (Hawk or Dove). The payoffs are given as (Player 1, Player 2). The condition  $V > c$  is noted to the right of the matrix.

	$\left(\frac{V-c}{2}, \frac{V-c}{2}\right)$	$(V, 0)$
	$(0, V)$	$(V/2, V/2)$



$V > c$

Image by MIT OpenCourseWare.

# Hawk-Dove game



The image shows a 2x2 payoff matrix for the Hawk-Dove game. The rows represent the strategies of the first player (Hawk or Dove), and the columns represent the strategies of the second player (Hawk or Dove). The payoffs are given as (Player 1, Player 2). The condition  $V < c$  is noted to the right of the matrix.

	$\left(\frac{V-c}{2}, \frac{V-c}{2}\right)$	$(V, 0)$
	$(0, V)$	$(V/2, V/2)$

$V < c$

Image by MIT OpenCourseWare.

# Chicken

A 2x2 payoff matrix for a 'Chicken' game. The lion's strategies are 'Run' (left column) and 'Stand Firm' (right column). The chicken's strategies are 'Run' (top row) and 'Stand Firm' (bottom row).





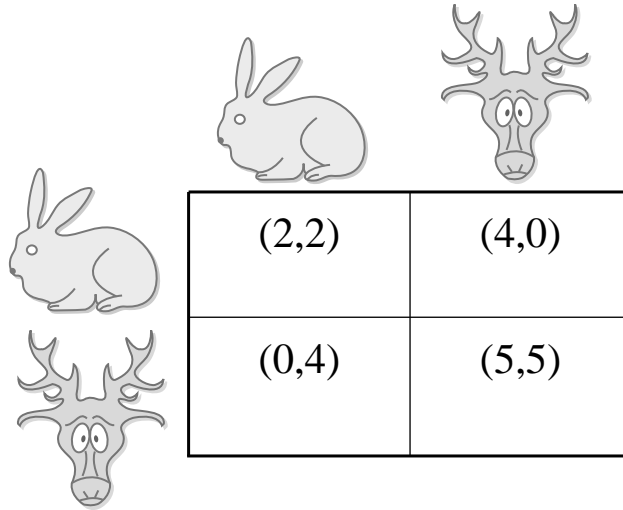
	
 	
$(-1, -1)$	$(1, 0)$
$(0, 1)$	$(1/2, 1/2)$

Image by MIT OpenCourseWare.

# Stag Hunt



A 2x2 payoff matrix for the Stag Hunt game. The rows represent the choices of Player 1 (Rabbit or Stag) and the columns represent the choices of Player 2 (Rabbit or Stag). The payoffs are shown in the cells of the matrix.





	 (2,2)	 (4,0)
	(0,4)	(5,5)

Image by MIT OpenCourseWare.

MIT OpenCourseWare  
<http://ocw.mit.edu>

14.12 Economic Applications of Game Theory  
Fall 2012

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.