

## Exercise 2.11

Consider an industry with two firms (1 and 2) that produce an homogeneous good. The inverse demand function is linear and is given by  $p=100-5Q$ , where  $p$  is the price and  $Q$  the market production.  $Q=q_1 + q_2$  and,  $q_1$  and  $q_2$  are the quantities produced by firms 1 and 2. The marginal costs of firms 1 and 2 are constant and identical, thus  $c_1=c_2=10$ . There are no fixed costs. Firms 1 and 2 choose quantities (production) to maximize profits. Las empresas 1 y 2, además, maximizan beneficios eligiendo la cantidad a producir como variable estratégica.

- Let us assume that firms decide simultaneously the quantities they produce and behave in a non-cooperative manner (Cournot). Calculate market price and production, and production and profits of firms 1 and 2.
- Let us assume joint-profit maximization (collusive behaviour), i.e. firms cooperate to maximize industry profits, and share production and profits evenly. Calculate market price and production, and production and profits of firms 1 and 2.
- Which would the optimal production for firm 1 in case it decides to deviate from the collusive agreement assuming that firm 2 keep its production unchanged? Which World be the market price and firms 1 and 2 profits?
- Calculate, comment and show in a figure the differences among the profits of firms 1 and 2 in cases a) b) y c) Do firms have incentives to maintain collusion?
- Using as starting point cases a) b) y c) fill up the cells of the following matrix of payments:

		Empresa 2	
		Cooperar	No Cooperar
Empresa 1	Cooperar		
	No Cooperar		

Which is the equilibrium of this static game? Is it pareto efficient?

- Consider an infinite repetition of this game. Describe the pair of trigger strategies of the supergame. Is it possible to get the pair of strategies (C, C) as the subgame perfect equilibrium of the game?