

1. Feram and Ocel are the only two steel manufacturers in the region. Feram is deciding whether to transport its steel with Truck or Rail. Ocel is deciding whether to produce its steel as Sheets or Beams. The payoff matrix shows the payoffs for each combination of strategies. The first entry in each cell shows Feram’s profit, and the second entry shows Ocel’s profit. Each firm independently and simultaneously chooses its strategy. Assume that Feram and Ocel know all the information in the matrix and do not cooperate.

		Ocel	
		Sheets	Beams
Feram	Truck	\$40 million, \$95 million	\$20 million, \$125 million
	Rail	\$50 million, \$75 million	\$30 million, \$25 million

Part A

What is Feram’s most profitable strategy if Ocel chooses to produce Sheets?

Part B

Does Ocel have a dominant strategy? Explain using numbers from the payoff matrix.

Part C

Identify the Nash equilibrium (or equilibria) for this game, or state that none exists.

Part D

Suppose Feram incurs a \$20 million increase in the cost of Rail transport, with no change in the cost of Truck transport. Redraw the payoff matrix, including the firms, strategies, and payoffs, showing how the \$20 million increase in the cost of Rail transport affects the payoff matrix.

Part E

Suppose instead that Feram and Ocel now cooperate and merge into one new firm, Acier, which is now the only producer of steel in the region. Acier produces the profit-maximizing quantity of steel and is earning positive economic profit. Draw a correctly labeled graph for Acier, and show each of the following.

- i. Acier’s profit-maximizing quantity, labeled Q_1
- ii. Acier’s profit-maximizing price, labeled P_1
- iii. The average total cost curve, labeled ATC, consistent with Acier earning positive economic profit
- iv. The area of deadweight loss, shaded completely

Part F

Government regulators impose a lump-sum tax on Acier. In the short run, will Acier’s profit-maximizing price of steel increase, decrease, or remain the same as a result of the lump-sum tax? Explain.