

Analyzing a Payoff Matrix – Please submit your completed assignment when finished.

1. Rocky Road and Two Scoops are two firms operating in an oligopolistic market. Each firm must decide how to price its ice cream. Profits will vary based on the pricing strategy a firm chooses and the strategy the competing firm chooses. The strategies and corresponding profits are displayed in the matrix below. Both firms have access to this information, but neither firm has communicated a strategy to the other. The information to the left of the comma corresponds to Two Scoops profits and the info to the right corresponds to Rocky Road's profits.

		Rocky Road	
		Price High	Price Low
Two Scoops	Price High	\$4000, \$5000	\$500, \$300
	Price Low	\$6000, \$1500	\$1000, \$2000

- a. Why is it necessary for firms in an oligopoly to consider the actions of rival firms? **Firms want to determine the most profitable strategies, and by considering and knowing the actions and general behaviors of rival firms, a firm can eventually settle on the most optimal strategy. While explicit collusion with rival firms to intentionally set higher prices and participate in strategies (“games”) with one another to the best benefit of each is illegal, tacit collusion is not. Tacit collusion can be achieved by considering and paying attention to rival firms’ behavior, so it is important for firms to consider it.**
- b. If Two Scoops chooses to Price High, what pricing strategy should Rocky Road use? Why? **Two Scoops Pricing High would warrant Rocky Road also Pricing High, as Pricing Low would produce much less profit than Pricing High (\$300 vs \$500).**
- c. Do either of the firms have a dominant strategy? If not, how do you know? If so, identify the dominant strategy for the firm(s). **Two Scoops has a dominant strategy to Price Low, because no matter what, profits will be higher than if they had Priced High (\$6000 vs \$4000 and \$1000 vs \$500). Rocky Road does not have a dominant strategy, because while Pricing High is best if Two Scoops also Prices High (\$5000 in profit), if Two Scoops Prices Low while Rocky Road Prices High (\$1500 profit), then it would have been better for Rocky Road to Price Low (\$2000 profit).**
- d. Why is “Price Low, Price Low” considered a Nash equilibrium? Use the numbers in the chart to explain your reasoning. **In this case, “Price Low, Price Low” is a Nash equilibrium because it is the dominant game theory strategy and in the best interests of both firms, assuming neither has any knowledge of the action the other firm will take. Essentially, even though “Price High, Price High” would be the best possible cooperative outcome for the firms, “Price Low, Price Low” is a safer bet. The dominant strategy for Two Scoops is to always price low, as they will either have \$6000 in profits or \$1000, always higher than if they priced high. Rocky Road also opts for Price Low because the dominant strategy of Two Scoops is apparent, and Price Low provides the best outcome in that case. If Rocky Road is sure Two Scoops will always opt to Price Low, then \$2000 is better than the potential \$1500 they would receive if they Priced High even while Two Scoops Priced Low.**
- e. If the firms were able to collude, what would be the cooperative outcome? Why is this unlikely to happen? Use numbers from the matrix to explain your reasoning. **Collusion**

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- would enable both firms to reach a cooperative outcome of “Price High, Price High,” giving the greatest possible benefit and profits for each party respectively. While Two Scoops may have achieved a potential \$6000 in profits instead of \$4000 in a noncooperative outcome, this would still be the best overall. However, this is unlikely to happen because not only would the firms have to communicate to achieve this cooperative outcome, but Two Scoops has high incentive to defect from a collusive strategy for its own gain. Cooperating would net Two Scoops \$4000 in profits while defecting would net it \$6000. So, while “Price High, Price High” would be the cooperative, collusive strategy, even were it to be implemented, it would not last, because Two Scoops would eventually defect to try and earn higher profits.
- f. What would be the harmful effects if the firms were able to successfully collude? **If the firms successfully colluded, they would both earn better profits than the “Price Low, Price Low” strategy, pursuing “Price High, Price High” instead. This would harm consumers by increasing prices across all competitors (in this case, only two) for all ice cream. Output may also be affected, and efficiency may be reduced. These are generally detrimental outcomes to the consumers in a market. Collusion, however, is unlikely in the first place, and unlikely to last in the second place.**