

Problem 1

Consider the following financial information that a regulator would have to use when regulating a natural monopoly.

- (a) A firm's equity has $\beta = 3$ and the S&P 500 market rate is $r_m = 4\%$. What is the firm's cost of equity? Assume the risk-free rate is zero.
- (b) The firm is financed by 40% equity and 60% debt. There are two forms of debt. First, the firm has 2,000 debt with a rate of 7%. Second, the firm has 3,000 debt with a rate of 12%. The marginal tax rate is 30%. What is the firm's cost of capital?
- (c) The firm has operational costs of 5,000 and a rate base of 20,000. Given your answer to the previous question, what should the regulator allow as required revenue?
- (d) The industry suddenly becomes riskier. Do you expect the firm's required revenue to increase or decrease?

Problem 2

Consider a monopolistic firm that manufactures frozen pizza (the upstream firm), and a monopolistic grocery store that sells the frozen pizzas to consumers (the downstream firm). The grocery store faces an inverse demand curve of $P_D = 200 - Q$ from consumers. The marginal cost of manufacturing one pizza is $MC = 40$.

- (a) If the two firms are separate, then find the quantity of frozen pizza produced, the price charged by the pizza manufacturer, and the price charged by the grocery store.
- (b) Pre-merger, calculate consumer surplus, producer surplus, and total welfare.
- (c) If the two firms merge, then find the quantity of frozen pizza produced, the price charged by the pizza manufacturer, and the price charged by the grocery store.
- (d) Post-merger, calculate consumer surplus, producer surplus, and total welfare.

Problem 3

Determine whether the following statements are true or false and explain why.

- (a) An upstream firm and downstream firm should be most likely to merge when each firm's investments only benefit itself.
- (b) If SANTOS and SAGASCO merged, then joint ownership of the Moomba processing plant would create a double marginalization problem.
- (c) A firm with positive accounting profits will always have positive economic profits.
- (d) Two firms are regulated as natural monopolies. The capital asset pricing model implies that a regulator should ensure that a firm in a "risky" industry should earn higher economic profits than a firm in a "safe" industry.