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 $\text{MC} = 40$.

(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 firms' 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.