Problem Set 1

ECONS 321 - Sports Economics

Due January 31, 2018

1 Revenue and Cost

A student intern discovers the following about the demand for attendance at a pro sports team's games: P = \$180 − 4A where P is the ticket price, measured in dollars, and A is their attendance measured in thousands of fans. Assume that marginal cost is \$20, and total cost is 20A.

a) Draw the attendance demand function.

b) Find the total revenue function and draw the curve on a different graph (put price on the y axis, and attendance on the x axis). What is the highest possible total revenue that the team can hope to collect? At what level of attendance is **total revenue** (not profit) maximized?

c) Find the marginal revenue function. Draw the marginal revenue and the marginal cost curves on the same graph. At what level of attendance is marginal revenue equal marginal cost? What is the significance of this attendance level (where MR = MC)?

2 Franchise Value

a) Suppose that Mark Cuban wants to purchase the Mavericks in 2000 (call this year 0), and he expects to receive \$400,000 in profits in years 1, 2, and 3 (each year). Now suppose that value of the Mavericks in year 3 is \$500 million and that the interest rate is 4%. What is price that Mark would pay to make him break even in 3 years (i.e. that makes E[B] − p =0)?

b) Now, suppose that Mark Cuban plans to purchase the Mavericks in 2000 for \$285 million and he expects to receive \$400,000 in profits in years 1, 2, and 3 (each year). Now suppose that the interest rate is 4%. What would be the value of the Mavericks in 3 years that would make Mark break even?

c) Finally suppose Mark plans to purchase the Mavericks at \$285 million in 2000. The value of the mavericks will be \$500 million in 3 years and the interest rate is 4%. Suppose the expected profits for years 1, 2, and 3 is x (i.e. Mark expects to receive x in year 1, x in year 2, and x in year 3). What is value of x that would make Mark break even?

3 Revenue Sharing

Suppose the Pullman Bison play the Moscow Tigers in a stadium with a capacity of 33,000 seats. 25,000 seats are allocated to the home team (the Pullman Bison) and 8,000 seats are allocated to the away team (the Moscow Tigers). Suppose that each team can charge only one price (although

the home price tickets and the away price tickets don't have to be the same). Also assume that away fans cannot purchase home tickets, and home fans cannot purchase away tickets. The demand for home tickets is given by the following function:

$$P_H = 140 - 3H$$

where H is the home attendance in thousands. The demand for away tickets is given by the following function:

$$P_A = 60 - 4A$$

where A is the away attendance in thousands. Lastly, assume that one group's demand is not affected by the other group's choices and that the marginal cost for both teams is $20 and total cost is 20H for the home team, and 20A for the away team. Further assume that the home team is the team in the strong market, and the away team is the team in the weak market.

a) What is the profit maximizing price for each team? What are the corresponding attendances for each fan base?

b) Now suppose that the league employs revenue sharing. They want to choose between the following plans:

Plan 1: 80-20

Plan 2: 60-40

Find the profit-maximizing price and attendance for each team and each plan (you should have a price for home and away tickets for each plan, and home and away attendance for each plan).

c) Why would the league want to employ revenue sharing?