ECON 301, Professor Hogendorn, Fall 2014

Second Midterm Exam

Each part of a question (a, b, c, etc.) is worth 5 points. Make sure to allot your time accordingly. Total of 35 points, -1 for messiness, -2 for extreme messines.

Please write on one side of the blue book pages. When you are finished, please keep the exam sheet and hand in your blue book. Thanks.

1. *CheapB.* If firm A has a monopoly with demand curve $p(Q) = 5 - 2Q$ and total cost curve $TC(Q) = 2Q$, it will maximize profits when it chooses $Q_A = 3/4$ and $p_A = 3.5$. Its profit will be $\pi_A = 1.125$.

    (a) Firm B also has demand curve $p(Q) = 5 - 2Q$, but its total cost curve is $TC(Q) = Q$. Find the profit maximizing Q_B, p_B, and π_B and draw on a graph.

    (b) Explain in words why firm B produces more than firm A.

    (c) Suppose firm A and firm B play a simultaneous move game to enter a market. If firm A enters and firm B does not enter, then firm A gets the monopoly payoff as above. Similarly if firm B enters and firm A does not. If neither firm enters, both get 0. If both firms enter, firm B will set price $p = 3.4$ to undercut firm A. Firm A gets nothing and firm B gets the resulting profit based on a price of 3.4. Show the matrix form of this game. What is/are the Nash equilibrium(a)?

    (d) Suppose instead that the game is sequential. Firm A can choose enter or not enter, and then seeing this, Firm B chooses enter or not enter. The payoffs are the same as in part (c). What is the subgame perfection Nash equilibrium. Describe it in

words, making sure to use the term "credible threat" or "incredible threat" as appropriate.

2. *Growing.* Along with the fracking boom has led to a increased demand for drilling supply equipment. Suppose Stewart Manufacturing Co. (perhaps owned by a distant cousin of Wesleyan physics professor Brian Stewart) is one of many perfectly competitive firms in the drilling supply industry. It has a production function that uses labor and steel and an upward-sloping marginal cost curve. Both labor and steel are variable factors in the short run.

   (a) Market demand for drilling supply equipment rises. Draw a graph of the overall equipment market and separately draw a graph of Stewart's firm-level demand and cost curves. Show how, in the short run, the increase in market demand affects prices and quantities on both graphs.

   (b) Though market demand for oil equipment rose, Stewart buys labor and steel in much larger markets where wages and the price of steel remain unchanged. Draw a graph showing Stewart's isoquants and isocost lines. Show the situation before and after the increase in market demand (again in the short run, but remember both factors are variable).